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ONES TO WATCH



Turn to Page 5 to meet these Ones to Watch.

MEET **33** RISING STARS

They've been trained, mentored and measured, and now they're ready to take charge. Our special coverage begins on Page 30 and includes:

HOW TO DEVELOP LEADERS

Smart CIOs know that nurturing IT leaders is good for their organizations—and for them.

PROFILES IN LEADERSHIP

The qualities CIOs should be on the lookout for.



**HOW CAN WE MAKE SURE INNOVATION
DOESN'T HAPPEN ONLY IN R&D?**

**HOW DO WE CREATE NEW VALUE
WITHOUT CREATING COMPLICATIONS?**

**HOW COULD WE TURN VOLATILITY
INTO AN ASSET?**

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10



1995 - 2005

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Ash Brooks,
Arrow Electronics

Mary Finlay,
Partners HealthCare
System

Yomi Famurewa,
ArvinMeritor

Rusty Yeager,
HealthSouth

Leslie Lambert,
Sun Microsystems

Chuck Scoggins,
Hilton Hotels

Kevin Smith,
Intermountain Health Care

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ONES TO WATCH

Leadership Development

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With our new Ones to Watch award, we honor a stellar group of future CIOs. **Feature by Edward Prewitt**

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A guide to developing your future leaders.

Feature by Thomas Wailgum

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Our 33 Ones to Watch honorees possess vision, the ability to influence others and a talent for getting things done.

Feature by Stephanie Overby

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The 33 Ones to Watch honorees come from a wide range of backgrounds, but all share a passion and a talent for leadership.

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A black and white photograph of a person's face, partially obscured by a large, bold, white text overlay that reads "The email". The person's face is visible in the background, with their eyes looking down. The text is in a large, sans-serif font, with the word "The" in a smaller size than "email". The overall image has a high-contrast, grainy aesthetic.

"The email

is down”

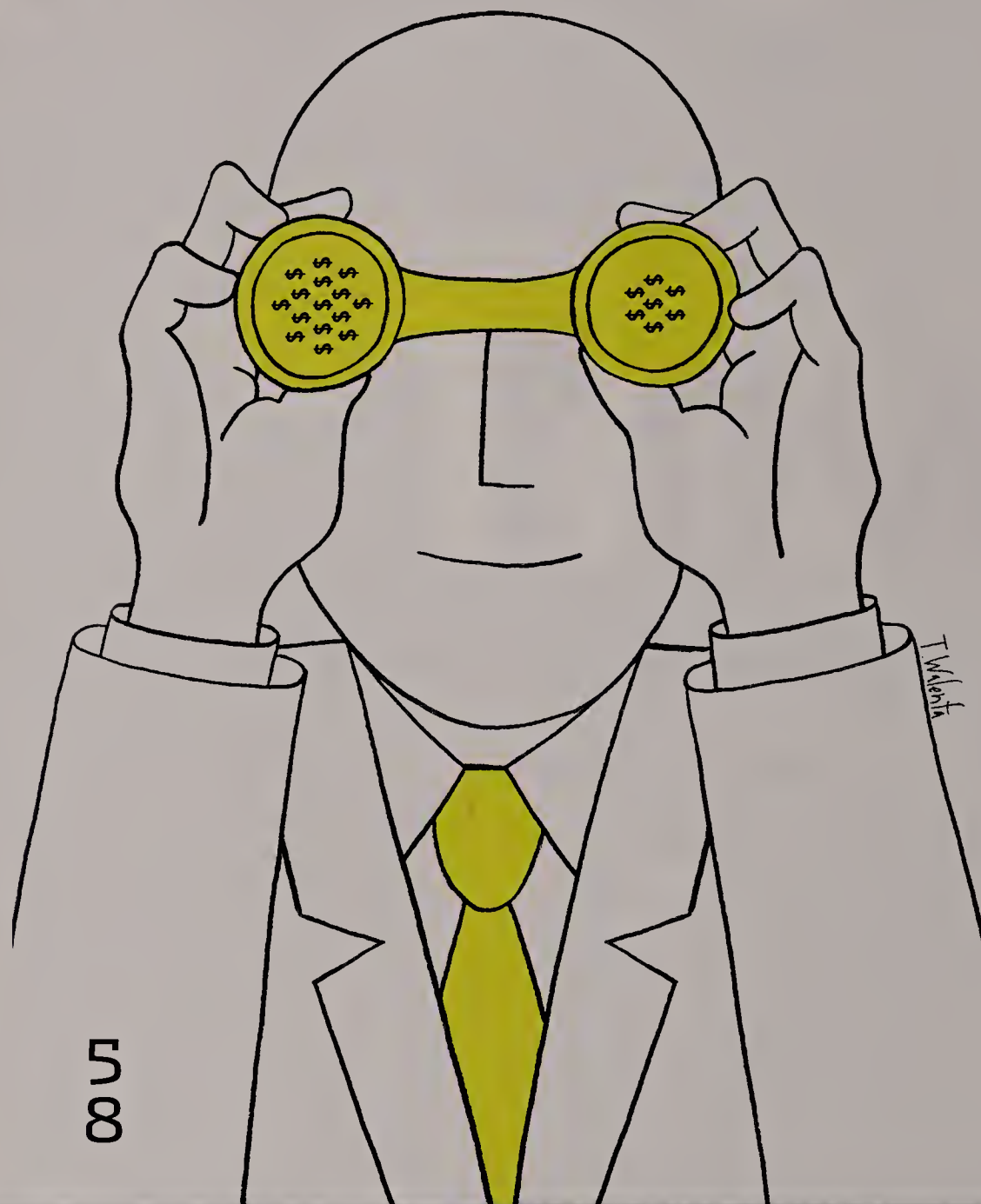
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Column by Michael Schrage

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Column by Monte Ford

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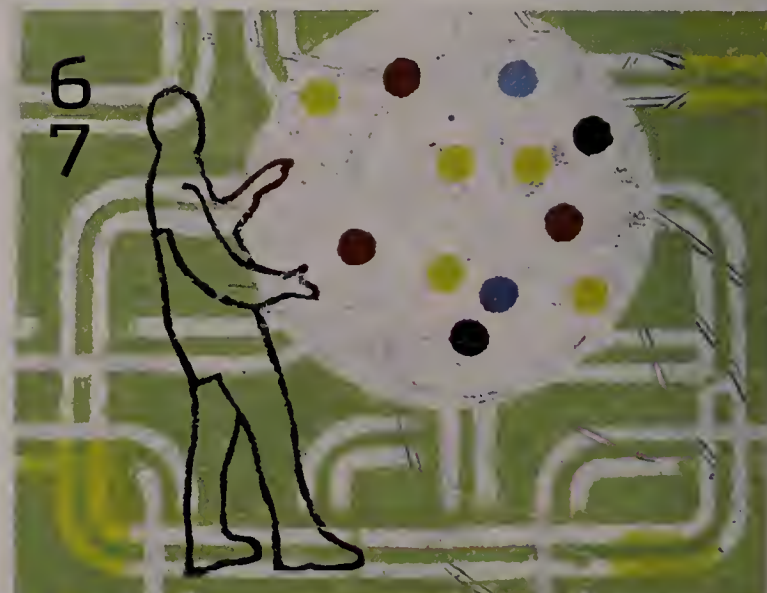
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ONES TO WATCH SURVEY RESULTS

We asked the 33 honorees of the first annual Ones to Watch awards questions about training, leadership and mentoring. Do most of them have MBAs? Were stretch assignments or mentoring more important toward their progress? Read the answers, and benchmark your up-and-comers' careers goals. Find the link at www.cio.com/071505!



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MANAGING EDITOR, PRODUCTION Cheryl R. Asselin
EXECUTIVE EDITORS Alison Bass,
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SENIOR EDITORS

Scott Berinato, Alice Dragoon,
 Stephanie Overby, Elana Varon

SENIOR WRITERS

Meridith Levinson, Susannah Patton, Ben Worthen
STAFF WRITER Thomas Wailgum

CONTRIBUTORS

Michael Fitzgerald, Monte Ford, Grant Gross,
 Eric Knorr, Juan Carlos Perez, Megan Santosus,
 Michael Schrage

DESIGN

EXECUTIVE DIRECTOR, ART AND DESIGN Mary Lester
ART DIRECTOR Terri Haas
ASSOCIATE ART DIRECTORS
 Owen Edwards, Matthew Goebel
ASSOCIATE DESIGNER Neva Tachkova
DESIGN OPERATIONS SPECIALIST Rachel Barnett

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EDITORIAL ASSISTANTS

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RESEARCH & PROJECTS

RESEARCH EDITOR Lorraine Cosgrove Ware
ASSOCIATE RESEARCH ANALYST Julie Hanson
SPECIAL PROJECTS MANAGER Lynne Z. Rigolini

ONLINE EDITORIAL

WEB EDITORIAL DIRECTOR Art Jahnke
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 Janice Brand
WEB EDITOR Sandy Kendall
WEB WRITER Paul Kerstein



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CEO Pat Kenealy
BOARD CHAIRMAN Patrick J. McGovern



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WHAT WE COVER, WHOM TO CONTACT

INDUSTRY

Automotive
 Edward Prewitt, eprewitt@cio.com
Financial Services
 Elana Varon, evaron@cio.com
Health Care
 Alison Bass, abass@cio.com
Manufacturing, Business-to-Business
 Christopher Koch, ckoch@cio.com
Manufacturing, Business-to-Consumer
 Susannah Patton, spatton@cio.com
Public Sector
 Allan Holmes, aholmes@cio.com
Retail
 Meridith Levinson, mlevinson@cio.com
Transportation
 Stephanie Overby, soverby@cio.com
Travel/Leisure/Entertainment
 Alice Dragoon, adragoon@cio.com

BUSINESS & TECHNOLOGY

Architecture
 Christopher Koch, ckoch@cio.com
Customer Relationship Management (CRM)
 Alison Bass, abass@cio.com
 Alice Dragoon, adragoon@cio.com
E-Commerce, Business-to-Business
 Christopher Koch, ckoch@cio.com
E-Commerce, Business-to-Consumer
 Meridith Levinson, mlevinson@cio.com
Emerging Technology
 Christopher Lindquist, clindquist@cio.com
Enterprise Resource Planning (ERP)
 Ben Worthen, bworthen@cio.com
Integration
 Christopher Koch, ckoch@cio.com
Leadership and Management
 Edward Prewitt, eprewitt@cio.com
Legislation and Regulation
 Allan Holmes, aholmes@cio.com
 Ben Worthen, bworthen@cio.com
Outsourcing
 Stephanie Overby, soverby@cio.com
Project Management
 Mindy Blodgett, mblodgett@cio.com
Public Sector (Government IT)
 Allan Holmes, aholmes@cio.com
Risk Management
 Allan Holmes, aholmes@cio.com
Security/Privacy
 Scott Berinato, sberinato@cio.com
 Allan Holmes, aholmes@cio.com
Staffing
 Stephanie Overby, soverby@cio.com
Supply Chain Management
 Ben Worthen, bworthen@cio.com
Value and Measurement
 Mindy Blodgett, mblodgett@cio.com
Vendor Management
 Scott Berinato, sberinato@cio.com
 Susannah Patton, spatton@cio.com
Web Services
 Christopher Lindquist, clindquist@cio.com
 Elana Varon, evaron@cio.com
Workforce Connectivity
 (Wireless, Collaboration Technologies)
 Thomas Wailgum, twailgum@cio.com

COLUMN & DEPARTMENT CONTACTS

Book Reviews
 Elana Varon, evaron@cio.com
By the Numbers
 Lorraine Cosgrove Ware, lcogrove@cio.com
Essential Technology
 Christopher Lindquist, clindquist@cio.com
Executive Coach
 Edward Prewitt, eprewitt@cio.com
Forum
 Cheryl Asselin, casselin@cio.com
From the Editor
 Abbie Lundberg, lundberg@cio.com
From the Publisher
 Gary Beach, gbeach@cio.com
InBox
 Cheryl Asselin, casselin@cio.com
Keynote
 Alison Bass, abass@cio.com
Michael Schrage
 Alison Bass, abass@cio.com
On the Move
 Meridith Levinson, mlevinson@cio.com
Peer to Peer
 Alison Bass, abass@cio.com
Total Leadership
 Elana Varon, evaron@cio.com
Trendlines
 Elana Varon, evaron@cio.com
Washington Watch
 Allan Holmes, aholmes@cio.com
 Ben Worthen, bworthen@cio.com

E-MAIL letters@cio.com **PHONE** 508 872-0080 **FAX** 508 879-7784 **ADDRESS** CIO Magazine, CXO Media Inc.,
 492 Old Connecticut Path, P.O. Box 9208, Framingham, MA 01701-9208 **WEBSITE** www.cio.com **SUBSCRIBER SER-**
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InBox



Avoid Brain Drain

We enjoyed the May 1 article "How to Salvage Your Company's Deep Smarts" by Dorothy Leonard. As argued by the authors, most organizations have a poor understanding of the concept of deep smarts, and hence cannot manage individuals who possess them.

We would like to offer another concept, *Hikitsugi*, which translates to "knowledge assumption." The practice can be found in a typical Japanese company. Before an employee leaves an organization, he documents the knowledge that a newcomer would need in order to perform his soon-to-be-vacated job. Details include the description of daily tasks as well as the habits or characteristics of clients.

The reason is simple: Prevent the external world from witnessing discontinuities caused by knowledge loss or mobility. Unless organizations institutionalize such programs, managing deep smarts will remain in the periphery and be conducted in an ad hoc manner.

YUKIKA AWAZU, Vice President
KEVIN C. DESOUZA, President
The Engaged Enterprise
awazu@engagedenterprise.com
desouza@engagedenterprise.com

What Happened at Comair

I can't help but commiserate with the folks at Comair ["Bound to Fail," May 1]. Technology projects are hard enough without having to deal with labor unions.

I was the project manager in the late '90s at TWA, hired to implement just a portion of what Comair is trying to replace. My project was to put in place a new scheduling system for the pilots. It took a complete restart on the project and more than three years. I had to do things I never dreamed would be part of a technology project. I gave speeches to the union governing council and was part of the negotiation team. We spent one year alone just in negotiations with the pilot union.

If you think it is tough to turn a company, try doing it with a union. We did end up with a successful installation, however. We surveyed the pilots (two months into the rollout) and got a 94 percent acceptance rating for that project.

Given the struggle that it takes to get unions to agree to even mutually beneficial change, the company is left in the position of trying to get old work rules to fit with modern technology. That is the wrong way to do it. Comair will find itself starting over several times before realizing that it will have to update the rules to update the technology. The project manager and CIO have to be salesmen, negotiators and technocrats at the same time.

DARRELL HAMILTON
Strategic Director, LabCorp
darrellsherry@bellsouth.net

The fact that the Comair system was "vendor managed" as opposed to being managed by someone in-house is the most important lesson to be learned. When it comes to supporting core business functions, I believe the best form of risk management is still the old-fashioned kind—

employing people in your organization who thoroughly understand and are responsible for the system. Not only would such people have been more likely to recognize the looming risk and made this change prior to the problem, they most likely could have come up with a countermeasure that may have much more significantly mitigated the problem even after it occurred.

Although there is a huge temptation to treat every IT application as if it were a commodity that can be outsourced and managed like telephones, it's important to recognize that this isn't always the case. Sure, e-mail, financials, HR and the like have achieved commodity status for a majority of organizations. But core applications—such as ERP, CRM and SCM—have not reached this status, and I believe it will be several more years until they do.

The days when someone can take SAP out of the box and plug it in, or pay to rent it as a standard service and have the business see an immediate ROI, are still a ways off for most businesses. So while we all either buy commercial software for these business-critical purposes or elect to support legacy applications that accomplish the same things, the fact that you still need your own employees with responsibility both proactively and reactively supporting them seems to be unavoidable with the state of tools available today.

MARTY BELL
Vice President, Information Systems

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trendlines

EDITED BY ELANA VARON

NEW * HOT * UNEXPECTED

STUCK IN TRAFFIC? I.T. CAN EASE THE COMMUTE

TRANSPORTATION

Anyone who commutes by car (or has driven to the beach) knows that traffic is getting worse. In May, the Texas Transportation Institute released its 2005 Urban Mobility Report, a study that measures trends in traffic congestion from 1982 to 2003. Today's average traveler spends 47 hours in rush-hour traffic annually, up from 16 hours in 1982. And those delays come at a cost: In 2003, Americans were out \$63.1 billion in time and gasoline due to idling in traffic.

Obvious solutions to alleviate traffic would be increased road capacity, more mass transit and more carpools, but these can be problematic; road construction is expensive, and collective commuting goes against Americans' independent mind-set. But don't you fret, there are a number of technology-related initiatives that promise to ease our chronic traffic woes.

At the Center for Infrastructure and Transportation Studies at Rensselaer Polytechnic

Institute (RPI), director George List is leading a pilot project called the Advanced Traveler Information System, or ATIS. With ATIS, the speed, location and direction of approximately 200 cars equipped with wireless GPS and pocket PC devices are tracked by a central server at RPI. When these cars travel

along U.S. Route 4 and other roadways near Albany, N.Y., their location is plotted on a map. Based on the progress of the cars, the drivers are sent voice-based updates that alert them to impending traffic problems and that recommend alternate routes.

Continued on Page 18



To Stop Hacker Attacks, Don't Rely on ISPs

SECURITY Your Internet service provider isn't to blame if your company is hit with a distributed denial-of-service attack. That was the verdict of IT security professionals in a mock trial staged by Gartner at its IT Security Summit last month, in which ISPs were charged with not doing enough to keep subscribers' computers from being compromised and used as tools in attacks on corporate networks.

The plaintiffs, two fictional companies, argued that ISPs could do more to prevent so-called zombie machines from being used in attacks if they scan subscribers' computers, monitor traffic and shut down suspicious network uses. Real-life cybersecurity lawyer Ben Wright compared the ISPs' lack of enforcement to the owner of a dangerous piece of property (such as a shooting range) who doesn't buy a fence to keep others out.

But Stewart Baker, a partner with Steptoe & Johnson, who defended the fictional ISPs, argued that it would be a violation of privacy for ISPs to check subscribers' computers. Baker suggested that it's a computer owner's responsibility to protect against malicious viruses and worms.

The audience of hundreds of IT security professionals served as the jury, using electronic voting boxes to record their opinions. Only 30 percent backed the fictional plaintiffs. Fifty-four percent supported the ISP position, and 16 percent chose neither.

In a distributed denial-of-service attack, hackers often take over thousands of computers by sending out a worm that collects them, through an Internet relay chat server, into a network called a botnet. The bad guys then use these machines to mass attack and crash a Web server. —Grant Gross



They Want Their DSL

BROADBAND Subscribers in the United States favor **cable technology**, but elsewhere in the world, customers prefer **DSL** services for high-speed Internet access. A recent study by the Organisation for Economic Co-operation and Development (OECD) found **60%** of broadband customers in 27 member countries use DSL.

What CIOs Tell Their CEOs

CIO ROUNDTABLE In the arsenal of communication techniques, a message you can deliver quickly can be crucial for time-crunched encounters with the boss.

Question: If you had only a few minutes to tell your CEO about IT, what would you say?

Bob Wittstein, CIO, Sappi Fine Paper North America

Our CEO just started at the end of last year, so I needed a short, one-page trifold handout that said this is IT at Sappi, this is what we do. I always have the pitch from that IT marketing brochure in my head. It includes our mission statement and our strategy: Yes, we keep the engine running. But we're also about process innovation and about customer-facing innovation. And because we're part of a larger global company, we have to optimize IT for the entire corporation.



Bud Mathaisel, CIO, Soletron

The CEO is interested in strategy and direction. Strategy conversations are dependent on a stream of things coming together—conditions affecting the marketplace, what we are seeing from the competition, opportunities available through technology. Strategy work takes a block of time. It's less amenable to quick chat.



Al-Noor Ramji, CIO, BT Group

I would remind him that my job is to improve the customer experience by improving cycle times. If you do things faster and you get it right the first time, financials—everything—improves.



—Alice Dragoon and Elana Varon

Traffic

Continued from Page 17

Drivers of Acura's 2005 RL sedan can get real-time traffic information from XM Radio Service, a company that transmits radio signals to cars via satellite. The Acura system monitors traffic speed, accidents, construction and the weather. Drivers receive voice-based updates and—because the broadcasts are integrated with the navigation system—also receive suggestions for alternate routes. The Acura option isn't for everyone. For starters, the service is only available in 20 metropolitan areas (including notoriously congested Los Angeles and New York). And then, of course, there's the RL's base price of nearly \$50,000.

Something else that could ease traffic congestion is often given short shrift by state and local transportation agencies, and yet doesn't have to include whiz-bang technology: "Making traffic signals work more efficiently can improve traffic," says Shelley Row, the associate executive director of technical programs at the Institute of Transportation Engineers (ITE). Specifically, says Row, municipalities need to analyze signal timing at specific intersections every three to five years and make adjustments, something that a majority of agencies don't do. Recently, the National Transportation Operations Coalition released the National Traffic Signal Report Card, in which 378 transportation agencies in 49 states rated their own traffic signal operations. The overall grade: a D-minus.

When it comes to managing signals, the city of Bellevue, Wash., came in at the head of the class. Mark Poch, the city's traffic engineering manager, says 90 percent of Bellevue's 173 traffic signals are networked to a central computer. Closed-circuit TV cameras monitor traffic flow, enabling engineers—with the help of a PC—to tweak signal timing as situations warrant. And while Poch can't quantify time or money savings, he knows the incremental effect is significant. Take a busy intersection with 50,000 cars and then shave delays for each car by just five seconds. Multiply that throughout a metropolitan area, and there will be huge savings in time, gas and, ultimately, driver frustration.

—Megan Santosus

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Internet Users Ignorant About Data Privacy

E-COMMERCE Internet users in the United States are dangerously ignorant about the type of data that website owners collect from them and how that data is used, making them vulnerable to fraud and misuse of their personal information, a new study finds.

For the study, titled "Open to Exploitation: American Shoppers Online and Offline," 1,500 adult U.S. Internet users were asked true-or-false questions about topics such as website privacy policies. The survey was conducted by the University of Pennsylvania's Annenberg Public Policy Center and released last month.

Respondents generally failed the test, answering an average of seven out of 17 questions correctly. The study's interviews, conducted between early February and mid-March, yielded findings the authors consider alarming, including:

75% wrongly believe that if a website has a privacy policy, users' information will not be shared with third parties.

49% can't identify "phishing" scam e-mail messages, whose designs mimic the legitimate companies they purport to represent in order to lure users into entering sensitive information such as Social Security numbers.

68% can't name any of the three credit reporting agencies that enable consumers to monitor for attempts at identity theft.

To address the problems identified in the study, the authors propose increased consumer education, as well as new regulations requiring retailers to disclose what data they have collected about customers and when and how they will use it. In addition, it suggests replacing the term "Privacy Policy" used by most websites with the label "Using Your Information" to combat users' misconception that these documents are pledges not to share customer information.

—Juan Carlos Perez

washingtonwatch

EDITED BY **ALLAN HOLMES**

After Booze, Drugs?

Wine-buying ruling opens door to new legal challenges

Now that the Supreme Court has struck down restrictions on online interstate wine sales, expect companies that sell other regulated products, from caskets to cars, to pursue more business online.



Justice Anthony Kennedy

In May, the high court ruled 5-4 that state laws allowing local wineries, but not out-of-state wineries, to ship to state residents are discriminatory. The decision will force 24 states to revise their wine shipment restrictions.

Justice Anthony Kennedy, writing the majority opinion, said states that restrict wine shipments did not prove the laws prevent minors from buying alcohol. "The burden is on the state to show that the discrimination is demonstrably justified," according to Kennedy's opinion.

As a result, other state laws restricting e-commerce may come under fire. "The court reaffirmed that state laws which merely pro-

tect in-state businesses from out-of-state competition are unconstitutional," says Jerry Ellig at the Mercatus Center, a think tank at George Mason University.

States are the primary venue for e-commerce restrictions, but Congress hasn't moved to outright preempt the laws. Most bills in Congress would allow online sales of pharmaceuticals, for example, if the pharmacy complies with rules such as listing the states in which pharmacists are licensed.

With products such as cigarettes and contact lenses, states may argue they need to protect consumers, which requires them to restrict online sales, says Neal Osten, counsel with the National Conference of State Legislatures.

Still, expect more pressure from lobbying groups such as the Washington, D.C.-based NetChoice Coalition to block e-commerce restrictions. E-commerce restrictions cost consumers more than \$44 billion a year, according to Steve DelBianco, NetChoice executive director. Now, however, "the ruling raises the bar for a state to maintain legacy barriers to e-commerce," he says.

—Grant Gross

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BY LORRAINE COSGROVE WARE

TRENDLINES

Help for the Help Desk

Users want timely service and expertise when problems arise

Those folks on the help desk sure are nice, but they're not always, well, helpful. A recent study by Forrester Research found that while users are happy with their PC, e-mail and office productivity software, they're less satisfied with their help desk and internal communications from IT.

Close to half (48 percent) of the 2,138 technology users surveyed said they're "on the fence" or dissatisfied with help desk support and services at their companies. Users are most unhappy with the timeliness of updates regarding their issues, with 51 percent of respondents reporting they aren't completely satisfied. That could spell trouble for CIOs because, for many users, their help desk experience may be the only interaction they have with IT.

While the help desk staff is viewed as courteous, their expertise and ability to resolve requests in an appropriate time frame are questionable in the eyes of end users. Meredith Morris, a consulting analyst with Forrester Research, believes that the poor marks for expertise may pertain to the help desk's knowledge of specific business unit applications, processes and needs, in addition to overall technical knowledge. Among survey respondents who use custom-developed software, only 42 percent said they get adequate training.

The study concludes that because user satisfaction is a prevalent measure of the IT department's value and success, improving both internal SLAs and the perception of IT support must be a priority for CIOs.

Best Practices

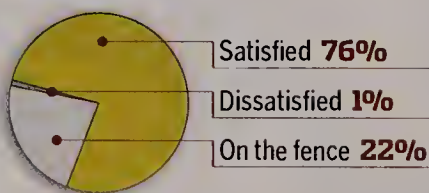
1] Keep users in the loop. Head off frustration by communicating the status of users' issues or call tickets and providing estimates of the time it will take to resolve each problem.

2] Check in with users. Conduct periodic user satisfaction surveys. Meredith Morris, an analyst with Forrester Research, suggests checking in with users after call ticket or issue resolution, or after a project that the help desk staff was involved with, such as PC deployment or application upgrades.

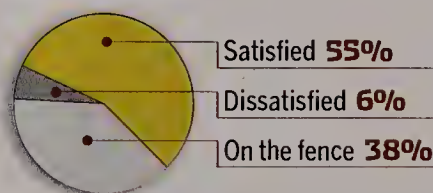
3] Talk IT up. Build confidence in IT by promoting the status of projects, milestones and success stories more frequently.

Describe your level of satisfaction with your company's IT help desk in the following areas?

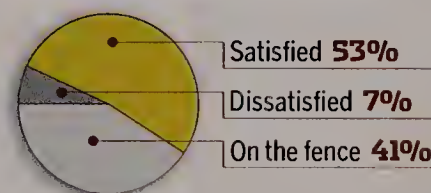
Courtesy



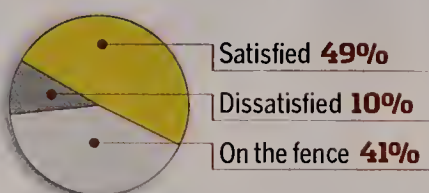
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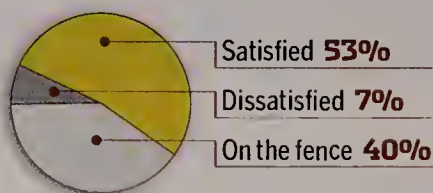
Expertise of the help desk



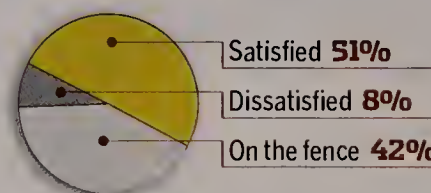
Timeliness of updates regarding your issue



Ability to resolve requests in a timely manner



Ability to resolve requests the first time around



SOURCE: "How Do Users Feel About Technology?" April 11, 2005, Forrester Research. Percentages may not equal 100 due to rounding.

Get Time on Your Side

Become a better leader by learning how to go with the flow

BOOK REVIEW Perhaps it's the elusiveness of time that makes us think that if we can just map it out (in a PDA), compress it (through e-mail) or shift it (TiVo, anyone?), we can create more of it and use it better.

Instead of being time managers attempting to outwit the clock with these confrontational methods, John Clemens and Scott Dalrymple, authors of *Time Mastery: How Temporal Intelligence Will Make You a*

Stronger, More Effective Leader, want us to become "time masters" by acquiring the "temporal intelligence" that can turn time into an ally. They define temporal intelligence as a mind-set with six attitudes toward time, including viewing time as subjective and elastic, and people and organizations as possessing unique rhythms.

The authors, who are management professors at Hartwick College, provide examples of

Time Mastery: How Temporal Intelligence Will Make You a Stronger, More Effective Leader

By John Clemens and Scott Dalrymple

Amacom, 2005, \$21.95



temporal intelligence in the experiences of dozens of leaders they have identified as time masters. The power of this book lies in those experiences, as well as in the unusual way it analyzes familiar leadership issues with time in mind.

Take crisis management, for instance. A crisis situation seems to require an immediate response. Yet from Clemens and Dalrymple's viewpoint, a more effective way for a leader to react is to "stop

time," with the goal of modeling the required staff perspective. "During a crisis, [I] always put on the kettle" to make tea, says the director of a company that offers leadership training in the form of crewing a yacht. If the skipper introduces a note of normality, how bad can the situation be?

Time Mastery is full of persuasively argued, time-based solutions and is well worth putting on a summertime—or anytime—reading list. —Carol Zarrow

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IT's Hardest Puzzle

Getting people to use a new system correctly is much harder than getting it up and running. And much more important.



After a year's worth of analysis and argument, a large division of a global telecom company committed itself to a major CRM deployment. This would be a Big Deal. The CRM vendor agreed to make a few nontrivial changes in its software to accommodate the Global Giant—that is, “to close the deal”—and both corporate IT and divisional IT agreed on the specs, the pilot and the implementation. Budget and schedule seemed reasonable.

Global Giant's sales, marketing, customer service and channel management departments, on the other hand, had yet to resolve their implementation concerns. They argued they couldn't realistically assess the business impact of a major system they'd never used before. They would work out their differences in the rollout.

While this didn't make the vendor, IT or Global Giant's management committee very happy, there was an undeniable logic to that argument. Having lived through a painful ERP implementation, everyone figured that the CRM implementation couldn't possibly be as bad.

They were wrong. Big time. Not even a year into the rollout, the vice president of sales was asked to resign. The head of channel management quit in frustration. Marketing and customer service—which had previously enjoyed cordial relations—hated each other with a passion. More important, several key customers of the telco, as well as some of its channels (stores and value-added resellers), didn't like how their business relationships were now being technically mediated and managed.

The irony? The CRM technology worked perfectly. IT and its vendor delivered what they had agreed upon and promised, on time and within budget. Virtually every technical milestone had been attained. Virtually every customer-touch and customer-



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Implementing a CRM system that is technically successful but fails to generate growth or savings is IT's version of "the operation was a success, but the patient died."

tracking process that had been selected by sales, marketing, customer service and channel management ran like an ibex on steroids.

Unfortunately, no one—except IT—used the CRM the way it was supposed to be used, including the customers and the channels. To the contrary, the telco's CRM deployment was a festival of perverse consequences. For example, the stores and value-added resellers were supposed to use the new CRM to manage their own inventory and fulfillment requirements independent of the salespeople. This didn't make the salespeople particularly happy, but it gave them more time and opportunity to sell.

However, these channels kept coming to the salespeople to see if they could get better terms than what the CRM was offering. A few of the cleverer and more—ahem—"customer-oriented" sales folks figured out how to "game" the CRM so that their channel customers got better price, delivery and credit terms. This unexpected intervention messed up both the logistics budgets and sales forecasts for the telco's division. Even worse, a couple of the channels that had played by the new CRM "order entry"

rules discovered that they got less favorable terms than their competitors. They complained. They were promised compensation for the differences in prices.

The result? The first six months of the CRM deployment ended up costing the company more money per unit sale. Even worse, the company's threats to discipline the salespeople who had gamed the CRM ruined the sales force's desire to work with the system. The vice president of sales made such a fuss about how his most creative salespeople were being "punished" for their ingenuity that harsh words were exchanged. He was asked to leave.

The new CRM provoked customer service's conflicts with marketing because the customer service reps now had to deal with two data entry and knowledge management systems—the existing one and the new CRM system. Customer service had traditionally helped solve customer problems first and promoted cross-selling and upselling second. In fact, customer service was seen as more of a "technical support" function than a marketing extension. The new CRM system was designed to make

Continued on Page 28

and then it hits you://

SECURITY IS ABOUT BETTER

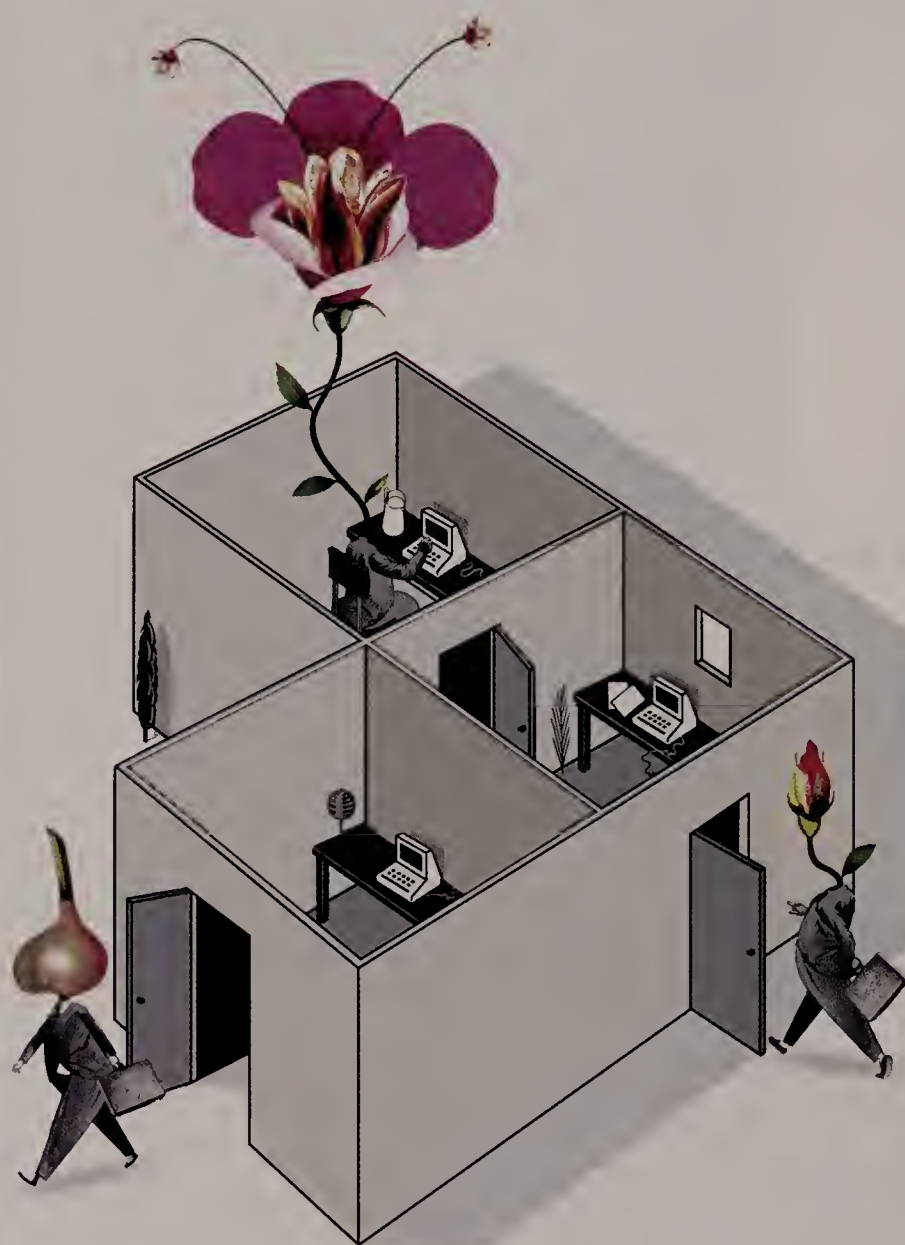
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Innovation. It's the latest buzzword in IT. I've been hearing it everywhere: at a recent vendor conference, at my weekly staff meeting. I've read about it in *CIO*. The vendors, my staff and the media aren't wrong. Innovation is imperative to every IT department. But if innovation is to be more than just a buzzword within our organizations, we need to manage our IT organizations in a way that encourages the growth and mobility of our employees.

You see, people are what really matter in this equation. People create innovation, and not just on certain days of the week or in designated brainstorming sessions. In order to ensure that an IT organization is bringing innovative solutions to bear on business problems and opportunities, you must pay close attention to the talent that is flowing into, up, and even out of the technology group. A stagnant IT organization is incapable of producing fresh ideas. You need a constant infusion of new blood and the perspective that comes from having new experiences, even if that means accepting turnover among your staff and challenging those who remain by pushing them into unfamiliar roles.

The CIO is responsible for setting the creative tone of the organization. I have found three ways to foster mobility within an IT organization in order to encourage a culture of innovation.

Accept Attrition

I once worked at a company where attrition was almost nonexistent. Rather than a sign that the company was a great place to work, it was an indication of stagnation. Within the IT organization, the response to any new idea typically was, "But we've always done it this way."

One thing I learned from this experience is that moderate attrition invites a healthy flow of external talent into an organization. In an environment where innovation is encouraged, attrition is not something leaders are terrified of, because it opens doors for fresh ideas and new perspectives.

Of course, no one wants to lose good people. But letting them go can have unanticipated benefits. Others may emerge from their shadows to achieve positive things that surprise management, their peers and sometimes even themselves.

You can use attrition to strengthen your organization by redefining any open positions. Consider hiring a recent college graduate skilled in the latest technology for a new position. Or give an existing employee the challenge of creating a new job. Both of these choices force employees to bring new and creative ideas forward, ultimately requiring them to be innovative.

Invest in Top Performers

Identify your top performers at multiple levels and decide which of these people could learn to perform equally well elsewhere, whether in another area of the IT department or another part of the company. The natural response to a new role is to take a fresh approach because you're not vested in the old way

The natural response to a new role is to take a fresh approach because you're not vested in the old way of doing things. And so, anytime you put talented people in new positions, they tend to change things for the better.

of doing things. And so, anytime you put talented people in new positions, they tend to change things for the better.

The only way this approach can be effective is to employ hands-on management of high-potential employees. At American Airlines, I require each project team to meet with me quarterly for a "deep dive" meeting during which we review costs, schedules and the overall health of the project. I expect all team members to attend these meetings, not just my direct reports. And I expect team members at all levels to be active participants.

If a junior team member speaks up to offer a suggestion about how to solve a problem that the team is encountering, I learn a lot about how that person thinks and what risks she is willing to take. At the end of each series of deep-dive sessions, I know not only how we are succeeding and where our challenges lie, I also have insight about the people in the organization.

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With this information as a backdrop, I meet quarterly with my direct reports to evaluate our list of high-potential employees. Those who are creative, who are willing to take risks and who won't accept mediocrity will rise to the top. I expect my team to take detailed notes about these employees so that we can identify opportunities for their career advancement and for utilizing their unique problem-solving skills.

Address Management Gaps

In addition to identifying promising talent, CIOs also must determine what skills or practices are missing in their organizations. Keeping employees up-to-date with information and training in the latest technologies and management techniques can mean the difference on whether an employee—and an IT organization—is able to innovate.

One way to tell if your organization's skill gaps are being addressed is to examine the types of problems the organization has to solve. If the problems are becoming progressively "better"—for example, you're not dealing with the same infrastructure problems you've had for years or struggling with the same personnel problems you struggled through in the past—then

you're doing a good job addressing your group's weaknesses.

When I came to American Airlines four years ago, IT portfolio management was viewed as a nice idea, but nowhere close to a reality. Since then, my team and I have put a portfolio management system in place and trained our staff on how to use it. The system itself was an innovation: Now, the executive committee is able to see clearly how IT functions and how we make financial decisions. We are better able to direct our spending to areas most closely aligned with the company's strategic plan, allowing us to think creatively about other business problems.

So the next time you hear the word innovation, remember that the source of everything your organization creates is the people you employ. Without talented, smart people, our IT departments will fall flat. It's up to us to create an environment that encourages people to perform beyond even their own expectations. That's where true innovation lies. **CIO**

Monte Ford is senior vice president and CIO of American Airlines. Send feedback about this column to leadership@cio.com.



Michael Schrage IT'S ALL ABOUT THE EXECUTION Continued from Page 25

it easier for customer service to help marketing line extensions and innovative services. Unfortunately, the service reps now had to juggle logging, recording, and responding to technical and logistics concerns while also responding to prompts for inquiries and upselling from the CRM system. Given that they were evaluated on how many customer calls they could bring to satisfactory resolution per hour, they couldn't do both well. So they did neither well. Customer satisfaction dropped.

Finally, because the new system sought to serve Web-based online order entry and configuration, the telco's sales site asked existing customers to fill out a new form and set up new passwords for security and systems integrity purposes. Twenty percent of the existing online customer base declined to do so and went to the phones—which pushed up cost-per-sales and led to abandoned purchasing efforts because of the delays associated with the unexpected surge of inbound calls.

Even though the technology performed to spec, who got blamed for this cavalcade of customer and channel conflict? Why, the CIO, of course! The CEO, the CFO and the COO raked the poor schmo over the coals for practically every CRM mishap that materialized.

Is that grossly unfair? Of course! But the CIO made one of the biggest—and most common—implementation errors that undermine IT's credibility. He confused implementing systems that *work effectively* with implementing a system that is *used effectively*. Implementing a CRM system that is technically successful but fails to generate growth or savings is IT's version of "the operation was a success, but the patient died."

So what happened? During the pilots, marketing and sales did observe some of the early perverse behaviors that ultimately scaled into money-losing fiascos. What did they do? They told IT to press on while they dealt with it. Foolish IT!

Consider this simple thought experiment: Suppose everybody in the organization was given a free corporate car. Within 90 days, a third of the cars are damaged, involved in accidents, towed or otherwise create a liability for the firm. Who would be held responsible? The irresponsible individuals who abused their vehicles? Not likely. In most organizations, the likeliest scapegoat would be the people responsible for handing out those "free" corporate cars.

That was IT during this CRM implementation. The folks who distribute, champion and install "productivity" tools are frequently held responsible for how those tools are used or abused. Turn the story around: You can be sure IT would grab the credit if the CRM system had transformed the business.

The lesson here is simple: Whether CIOs implement ERPs, SCMs or CRMs, only the most naive C-level executive focuses on whether the system actually works. Success will be—and should be—measured by how well that system is used. Don't think that's the CIO's job? Just try implementing a technically excellent system that's profoundly underutilized, and find out how forgiving your CEO, COO and CFO can be. **CIO**

Michael Schrage is codirector of the MIT Media Lab's eMarkets Initiative. He can be reached at schrage@media.mit.edu.



PHOTO BY JOHN SOARES

CIO Leadership Agenda 2005

What Will It Take for You to Succeed in 2005?

Drawing on continuous research with hundreds of IT executives and other business leaders and experts, *CIO*'s editors have identified the five must-dos that make up the successful *CIO*'s 2005 Leadership Agenda. CIOs who marshal their efforts behind these imperatives will get the most value from IT, help their enterprises compete more successfully and elevate the strategic importance of IT.

LEADERSHIP IMPERATIVES FOR 2005

- 1. Drive Innovation and Growth While Managing Costs**
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- 4. Develop the Next Generation of IT Leaders**
- 5. Manage CXO Expectations**

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In this issue, we focus on Developing the Next Generation of IT Leaders, with our special report, "Ones To Watch," on our inaugural Ones To Watch awards and the fundamental requirements for leadership development. Turn the page to begin fulfilling your leadership agenda. >>

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SPECIAL REPORT

ONES TO WATCH

With our new Ones
to Watch award, we honor a
stellar group of future CIOs

By Edward Prewitt

Part of the **CIO Leadership Agenda** series

Of all the leadership tasks that CIOs face, one of the most important is developing future IT leaders. It's one of the many duties that CIOs perform as part of their role in running IT, a means

of ensuring the long-term success of the enterprise and an important aspect of managerial responsibility toward employees. In today's demanding environment, CIOs can't possibly do it all themselves. But when talented people leave, the bench has to be stocked with others ready to step up.

In fact, developing the next generation of IT leaders is one of the five must-dos in our Leadership Agenda 2005 program. To put together this special report, *CIO*'s editors drew on research with hundreds of IT executives and other business leaders and experts to identify the top strategic imperatives for success as a CIO today. (Visit agenda.cio.com to learn more.)

Leadership development isn't formulaic; what works for one CIO can fall flat in the hands of another, or within a different corporate culture. In **"How Stars Are Made"** (Page 34), we detail current trends in leadership development, such as executive coaching and "action learning programs," and report on the experiences of a few IT executives with leadership development programs in place. At Sun Microsystems, for instance, CIO Bill Vass puts all of his up-and-comers through three assignments: an operations role, in which they learn the importance of excellent IT performance and develop a service mentality; a business systems development role, in which they get to know the business users and their needs; and finally, an IT process and architecture role, in which the future leaders apply what they've learned from the other two roles to the maintenance and extension of a stable, useful IT architecture.

In appreciation of CIOs who do leadership development right, we created a new awards program this year—Ones to Watch. This award identifies the rising stars in IT, senior staff who have what it takes to become the CIOs of the future.

The selection criteria for the Ones to Watch awards were rigorous. First, each candidate had to be nominated or sponsored by a CIO. A 13-member panel of working CIOs (see **"The Judges,"** Page 56), recruited from among our readers and the CIO Executive Council, reviewed and rated the applications. Each nominee was evaluated by two CIOs, who scored them on several different criteria. Honorees had to demonstrate expertise in a wide range of areas, including having held several jobs within IT as well as positions in functional areas outside of IT. They needed to have a long list of on-the-job accomplishments in their backgrounds, such as leading a large project or conceiving a new business product. They needed to be risk takers, team builders, mentors and change agents. After a final due-diligence review by *CIO*'s editors, 33 honorees rose to the top (see **"33 Rising Stars,"** Page 50).

We then stepped back for a look at what our honorees had in common. We found three overarching characteristics:

- **Vision**—an ability to see solutions in often chaotic situations.

- **Influence**—the capability to engage business users and other stakeholders in IT programs in a way that doesn't depend on the power of their position.

- **Execution**—the bottom-line ability to deliver, time and again.

Each of our honorees demonstrated all of these traits. In doing so (see **"What Leadership Looks Like,"** Page 40), they benefited their companies, made their CIOs look good and served as testaments to the importance of leadership development. **CIO**

Leadership and Management Editor Edward Prewitt can be reached at eprewitt@cio.com.

For information about the 2006 Ones to Watch awards, go to www.cio.com/awards.

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How Stars Are Made

A Guide to Developing Your Future Leaders

BY THOMAS WAILGUM

ING Insurance Americas CIO David Gutierrez needs little prodding to talk about the qualities of Raymond Karrenbauer, who is the company's CTO and a rising IT leader. "First off, he's brilliant," Gutierrez says. He then launches into how Karrenbauer came up with a new architectural framework for ING's systems in the United States, which was adopted by other ING CIOs across the Americas and in the Asia-Pacific group. But while Karrenbauer's IT skills shine bright, Gutierrez is quick to note that his leadership skills are equally strong. "A lot of people want to work with him," Gutierrez says. "He attracts a lot of people who want to excel."

Reader ROI

- ⌘ The fundamentals of successful leadership development
- ⌘ CIOs' experiences with various leadership development programs
- ⌘ How to keep your rising stars from leaving



If star employees aren't challenged, says **DAVID GUTIERREZ**, CIO of ING Insurance Americas, they will leave. He works hard to move his high-potentials to jobs in which complex IT opportunities arise.

If you aren't blessed with IT managers such as Karrenbauer—up-and-comers who are doing great things for IT in the here and now—where do you find them? The answer might be right outside your office door. Future leaders in information technology aren't born like that; they are made. By you. Karrenbauer's abilities didn't develop in a vacuum; he's the beneficiary of ING's and Gutierrez's longtime emphasis on leadership development.

The honorees of our inaugural Ones to Watch awards, including Karrenbauer and others whom we feature in "What Leadership Looks Like" (Page 40), have spent many years developing and honing their skills. Often, they were identified early on. They were challenged relentlessly, their weaknesses targeted for improvement, and only then, were they promoted. Most likely, a great boss or two has shown them plenty of attention—mentoring, guiding, pushing. "People aren't accidental leaders," says Keri Pearlson, director of the Senior IT Leadership Development Program at The Concours Group consultancy. "The truth is that leaders can be made."

The elements of leadership development plans vary by company and CIO. Some CIOs rely on mentoring programs or classroom courses; others challenge their high-potential employees with cross-departmental assignments or fast-tracking through the ranks. In a larger sense, though, the differences between the programs are inconsequential. What matters most is that CIOs have made talent-building a top priority.

The pedigree resulting from all this grooming has its costs. For CIOs, a leadership development program takes time, flexibility, forethought and patience. In short, it takes leadership from you. "You can't do leadership development half-heartedly," says MetLife CIO Steve Sheinheit, a judge of the Ones to Watch awards. Even ING's Karrenbauer isn't perfect, which is why leadership development never stops. "He still needs some grooming on how he addresses the business community," CIO Gutierrez says.

But leadership development programs are demonstrably worth the effort, say CIOs who have implemented them. They end up with a staff of highly skilled employees who are steeped in the inner workings of both IT and the business. These respected IT managers extend the influence of the CIO, as they go about getting buy-in from the business side of the organization. And because they know what the business needs, these up-and-comers are poised to churn out the next killer application or product.

Sheinheit, for one, scoffs at CIOs who are sitting on the sidelines, hoping leaders will emerge without any guidance or planning. "What else *would* you do?"

So, what *are* you doing?



Leadership development for up-and-coming IT workers can't be done half-heartedly, says MetLife CIO **STEVE SHEINHEIT**. It takes active, thoughtful participation from the CIO.

The Building Blocks of Successful Leadership Development

There are a few foundation stones necessary for any leadership development program. First things first: You can't have leadership development without support from Mahogany Row. As Cindy McCauley, a senior fellow at The Center for Creative Leadership, puts it, many effective leadership programs start at the top and cascade down. If your CEO or CFO thinks leadership development is a waste of time and money, chances are your leadership development plans will be sunk. "Senior management support is so powerful," says McCauley, who was trained as an industrial and organizational psychologist. When the support is there, "people's bosses have had the same experiences and

are using the same language," she says. And then leadership development is infectious, spreading out into the halls, cubes and conference rooms of the organization.

At the same time, CIOs must have just as much skin in the game as their CEOs. CIOs need to be role models, affirming that participating in leadership development is the only way to move ahead. According to Jay Conger, professor of leadership studies at Claremont McKenna College, CIOs have to say explicitly what leadership behaviors are important. Rather than just lauding "teamwork," for example, CIOs should say, "The ability to surface conflict with a group and constructively resolve it" is an expected behavior, he says. Equally important is that CIOs identify which leadership behaviors are not acceptable and make personnel decisions based on those guidelines. "You don't promote people who have bad behaviors," Conger says, such as a tendency to overwork their direct reports to the point of burnout. "They might get results, but they don't have appropriate behaviors." Finally, CIOs should highlight the positive behaviors of high-potentials as often as possible at meetings and IT department functions. "If CIOs do it once a year, then people will think that it's not that important," Conger says.

McCauley emphasizes that companies should first do an assessment of the business need behind any proposed leadership development program. For example, some companies may feel that they don't have enough high-potential people in their pipeline, or that their leadership needs have changed—for instance, they are expanding globally and need more managers to work cross-culturally. "The more that the content of the program is focused on the business issues that they're currently facing," she says, "then the more they can see the business imperative [for creating such a program]."

Making sure you have the right people in your program is also essential. Talent development usually takes a long time—years, in fact. But *leadership* development takes even more effort than simply picking out someone who is technically proficient and sending them to a management class. "Initially, when you come into IT at a lower

level, you are rewarded for your technical skills on a somewhat individual level," says MetLife's Sheinheit. "But as you move up, you are rewarded for your influence skills and your capability to understand complex issues."

A person's ability to stand out—first on his own, then among a peer group—is one of the ways that ING's Gutierrez spots future leaders. "You cannot really go into a group and point out the leaders; they have to show that leadership side," he says. "And we watch for those things: who is hungry to move ahead and be a leader." Gutierrez even goes so far as to send high-potentials for psychological evaluations if he thinks a person has the technical skills but may not have all of the managerial and leadership skills. "It's expensive for the company, but we are trying to create a population of good leaders here," he says.

Choosing the Right Leadership Development Program

There are more options for leadership development than any one CIO could ever need. Therefore, it's critical that CIOs choose carefully and implement programs that are best suited to the holes in their staff's skill sets and the overall company direction.

A leadership development program doesn't have to break your back, nor your training budget. "Not everything has to be a big, formal program," says McCauley.

Stretch assignments. One of the top leadership development methods among the 33 Ones to Watch honorees is stretch assignments—when an up-and-comer's mettle is tested in a task beyond his abilities. Their stories are wide-ranging: working in a developing country; having sole responsibility for large, highly visible and strategic programs; making a white-knuckle, \$150 million presentation to the CEO; having P&L responsibility while running an outsourcing deal; making corporate purchases for more than \$1 million; and consolidating three separate infrastructure departments into one organization.

6 Ways to Develop Highly Successful People

MetLife CIO Steve Sheinheit's keys for cultivating talent

1 Mentoring Relationships—essential to developing leaders in a company, whether the relationships are formal or informal. The people who grow in any organization and aspire to higher positions generally have had mentoring relationships throughout their careers.

2 Cross-Organizational Assignments—experiences that go on outside of a person's specific job role. IT staffers need to appreciate the importance of net-

working with people across and outside IT, because you never know what the next assignment will be.

3 Outside Associations—with any number of organizations, whether industry-related, research groups or educational associations. What's important is that employees are getting an appreciation of the outside world.

4 Enterprise View—broadening employees' perspectives as they go up the ranks. Incentives for establish-

ing an enterprise view are important for job effectiveness.

5 Committee or Governance Board—participation broadens IT staffers' enterprise views and shows them the dynamics of governance and how things get done inside a company.

6 Job Rotation—crucial because an employee in a job for a long time tends not to develop as effectively as someone who moves across different roles and responsibilities.

At ING, you need a world map to keep up with Gutierrez as he ticks off the global assignments and the changing positions for all of his leaders in training. The current CIO in Chile (one of 12 ING Insurance Americas CIOs) first gained notice for his work in Canada. An IT star from Mexico is now in the Hartford, Conn., office and shows a lot of promise. A former Chilean staffer is now in the Atlanta headquarters. An Argentinean up-and-comer is also being moved to Atlanta. "We try to make room for them, because we don't want to lose them," Gutierrez says. In a global company of 120,000 employees (12,000 of whom are in IT), he is not shy about moving his players to far-flung places where complex IT opportunities arise and stars are forged. If high-potentials can't be moved, then CIOs should look for ways to challenge them where they are.

Cross-training. At Sun Microsystems, CIO Bill Vass has designated three areas in which all of Sun's IT up-and-comers need to spend one to two years working: operations, business systems development and architecture. "They all know how to get ahead, and they gain that breadth of experience while doing it," Vass says. Every one of his 1,200 staffers moves into one of two tracks: general management or technical. In the general management track, which potentially points staffers toward CIO positions, they will have three jobs in Sun IT. One of Vass's protégés, Leslie Lambert, is a Ones to Watch honoree and has moved through all the tracks.

First comes an operations assignment. Vass describes it this way: "This is where you give up your life and carry a pager. And when things break, it's always not your fault. And the network will go down. And everyone is your boss and customer. And *everything* is an emergency." The desired outcome for staffers is that they will learn a service mentality. "It's high-adrenaline, but it's very important in IT to have that background," Vass says.

Second is a business systems development role, in which staffers get to know the users in the business and how to build the necessary systems. "They figure out what people in a business do for a living," Vass says. High-potentials learn how to automate a process or build a system, but in a way that will not keep the operations people up all night. The thinking goes, they won't want to do that because they know the operations role and its headaches.

Third, up-and-comers work in an IT process and architecture role, ensuring a consistent architecture when designing systems or processes. They draw on their previous roles in operations and business development to think about architecture decisions that won't drive the operations people crazy or slow down the delivery from the business development folks. "Can you look forward and understand what the architecture is going to be?" Vass asks of his staffers.

The power of cross-training lies in the multiple perspectives gained. "People who only do development or

people who only do architecture don't have a clue about production," Vass says. After his staffers go through the three roles, they understand the responsibilities of everyone they interact with in IT.

Another part of Sun's leadership development program is a business rotation that usually lasts three months to six months. In an interesting twist, the high-potential employees become business customers of IT. "They get to see what it is like when you can't book an order on an ERP system—what it's like to experience that from a business perspective," Vass says. They also see the other side of customizations, process changes and standards debates. Afterward, Vass says, they can come back to IS and say: I've done this job, I understand what the business is going through. In addition, they have forged business relationships and credibility.

The technology track is for Sun staffers who want to specialize in a specific technology area. These are the people who are stars in technical roles but just can't make it in the business role or can't work well with customers. "But you need those people who can fix anything," Vass says. "And even though they failed [in one of the non-IT



For employees to embrace leadership development programs, says Sun Microsystems CIO **BILL VASS**, the steps to success have to be clearly stated, and people who meet the requirements must be rewarded.

“You cannot really go into a group and point out the leaders; they have to show that leadership side. And we watch for those things: who is hungry to move ahead and be a leader.”

—David Gutierrez, CIO, ING Insurance Americas

environments], they’ve learned a lot.”

Action-learning programs. McCauley, of The Center for Creative Leadership, says a trend in leadership development is what she terms action-learning programs. These combine the classroom with cross-functional teams that take on a demanding project and use it as a learning vehicle, while at the same time creating a tangible benefit for the organization.

Not far from ING’s global headquarters in Amsterdam, a chateau houses the ING Business School. Here, promising IT and business workers are sent for weeks or months at a time to immerse themselves in the inner workings of the company and its businesses. The assignments begin before the staffers touch down in Europe and continue well after they have left. ING also offers online and classroom-based classes that address leadership on many levels. What’s key, Gutierrez says, is that there is a lot of prework for every course so that staffers come to the sessions focused and ready for discussion. “We don’t just read through the slides,” he says. “We already have questions for the presenter.”

Direct application. Other trends in leadership development include seminars in networking, presentation skills and expanding the influence of IT leaders. These kinds of courses arise from a desire to “leverage IT within the organization,” says Claremont McKenna College’s Conger. What they have in common is teaching immediately applicable skills. “It’s more like, Here’s what we’ve learned, now let’s go put it in use today,” he notes. (Conger says the funky outdoor experiences that were so popular several years ago, such as group tree-climbing, are less in use today.)

Sustaining the Enthusiasm

Once CIOs have decided on a leadership development direction, they need to actively manage the program to make sure the right people are getting into it and that it fulfills their intentions. McCauley advises collecting ongoing evaluations of the program to build up evidence that it is delivering value. Otherwise, training funds can disappear in a down economy, or a major emergency project can take away staffers.

Elements that prove value include: Peers and subordinates view program participants as more effective leaders; a majority of the hires for high-level positions are internal promotions; and ROI calculations prove the link between leaders and better business results (though McCauley says that can be difficult). CIOs need to track how much money and time they have invested, she says, and then see what changes people who have been through the program make when they go back to the workplace.

“People have to see results from” leadership development, Vass

says. He relates a story of a high-potential who approached him about becoming a CIO. Vass was able to plot out what the employee needed to do and the three areas he would have to work in. Though the person had some concerns about what he considered a slower career progression, Vass was able to convince him and guide him through each step. After the staffer completed the assignments, he was ready and quite happy to take a new role when a high-level position opened up. “You tell people, If you’re successful in the three roles [operations, business systems development and architecture], you’ll be promoted,” Vass says. “And everyone in the organization saw him work these roles and saw him get promoted.”

Not all rising stars stick around, waiting for that high-level job, of course. Inevitably, some leave for richer pastures or personal reasons. There’s not much CIOs can do to stop an employee who is determined to depart.

There are, however, practical and crucial ways to lessen the exodus. Conger says research shows that an employee’s boss is the single best determinant of whether a person will stay or leave. “So you have to assign your high-potentials to the best bosses,” he says. McCauley cites research from The Center for Creative Leadership and the American Productivity & Quality Center on the retention strategies used by five best-practice companies: compensation (both competitive pay and long-term incentives), opportunities for development and advancement, flexible working arrangements, and opportunities to take on significant responsibilities.

Above all, CIOs who have embraced leadership development say their programs aren’t just an IT thing; they are an outgrowth of company philosophies that are aligned with IT department priorities. “The company overall makes a very strong statement that having leaders is important for our company,” Gutierrez says. And when leadership development works, the Raymond Karrenbauers and other next-generation leaders of the world will give all that investment back to their companies with new systems and new ways of thinking that will make their CIOs very happy. **CIO**

Staff Writer Thomas Wailgum recently wrote about succession planning and entry-level IT workers. E-mail him at twailgum@cio.com.

CIO Leadership Agenda 2005

This story targets the Leadership Agenda topic **DEVELOPING THE NEXT GENERATION OF I.T. LEADERS**. You’ll find more material on this and the four other must-do topics for 2005 on the dedicated website **AGENDA.CIO.COM**. Look there throughout the year for articles, tools and webcasts on driving innovation, proving IT value, running IT efficiently, developing leaders and managing expectations.

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Dale Slaughenaupt,
BEA Systems

Judith Spitz,
Verizon Communications

Shadman Zafar,
Verizon Communications

Larry Stofko,
St. Joseph Health System

Timothy A. Waire Jr.,
Constellation Energy Group

Michael Carlson,
Xcel Energy

Tony Habash,
AARP

What Leadership

Our 33 **Ones to Watch** honorees possess vision, the ability to influence



Gudrun Neumann,
American Century
Investments

Kim Langford,
Ontario Ministry of
Transportation

Cheryl Monroe,
Align Technology

Robert Machen,
Hilton Hotels

Kay Sallee,
ConocoPhillips

Darren Dworkin,
Boston Medical Center

Eric Dirst,
Sirva

Ash Brooks,
Arrow Electronics



Cheryl Cohen,
ManTech International

Bill Chapman,
Avnet

Peg Davis,
City of Phoenix

Mark Kiernan,
GMAC Commercial
Holding

Deborah Judy,
United States Postal Service

John Heveran,
MCI

Pradeep Kumar,
APL

Looks Like

others and a talent for getting things done

Reader ROI

- How to find a future CIO on your staff
- The winning traits exhibited by these leaders
- Their character-forming experiences

BY STEPHANIE OVERBY



Mary Finlay,
Partners HealthCare
System

Yomi Famurewa,
ArvinMeritor

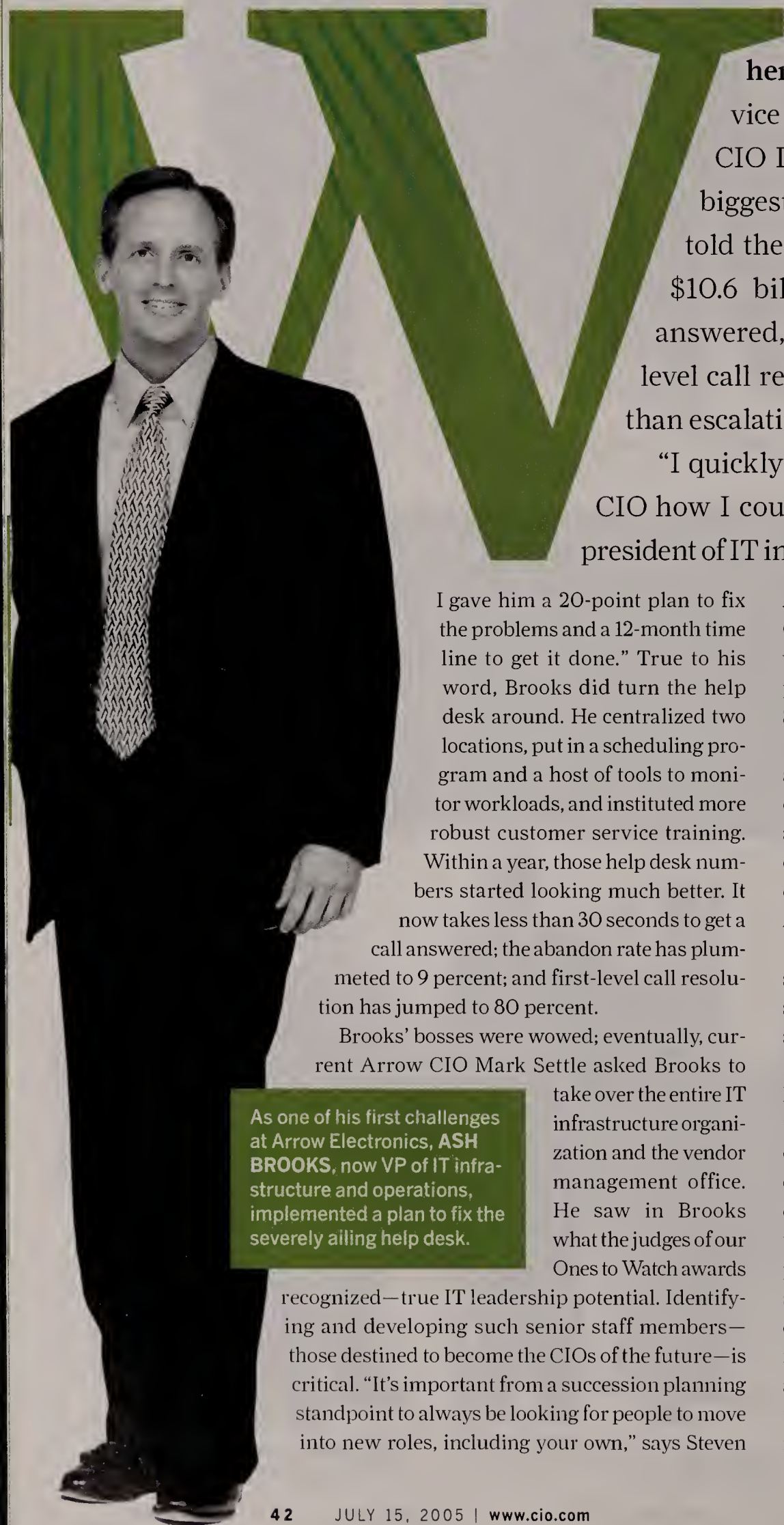
Rusty Yeager,
HealthSouth

Leslie Lambert,
Sun Microsystems

Chuck Scoggins,
Hilton Hotels

Kevin Smith,
Intermountain Health Care

Raymond Karrenbauer,
ING Insurance Americas



When Ash Brooks first joined Arrow Electronics as vice president of end user computing in late 1999, then-CIO David Westmoreland asked him to deal with his biggest headache—the help desk. Three major metrics told the terrible tale of the poor help desk service at the \$10.6 billion company. Calls took two minutes to be answered, half of the users who called gave up, and first-level call resolution—whereby problems were solved rather than escalating to the next level—was a dismal 40 percent.

“I quickly assessed the situation and immediately told the CIO how I could change it,” recalls Brooks, now Arrow’s vice president of IT infrastructure and operations. “In less than a month,

I gave him a 20-point plan to fix the problems and a 12-month time line to get it done.” True to his word, Brooks did turn the help desk around. He centralized two locations, put in a scheduling program and a host of tools to monitor workloads, and instituted more robust customer service training. Within a year, those help desk numbers started looking much better. It now takes less than 30 seconds to get a call answered; the abandon rate has plummeted to 9 percent; and first-level call resolution has jumped to 80 percent.

Brooks’ bosses were wowed; eventually, current Arrow CIO Mark Settle asked Brooks to

As one of his first challenges at Arrow Electronics, **ASH BROOKS**, now VP of IT infrastructure and operations, implemented a plan to fix the severely ailing help desk.

take over the entire IT infrastructure organization and the vendor management office. He saw in Brooks what the judges of our Ones to Watch awards

recognized—true IT leadership potential. Identifying and developing such senior staff members—those destined to become the CIOs of the future—is critical. “It’s important from a succession planning standpoint to always be looking for people to move into new roles, including your own,” says Steven

Agnoli, awards judge and CIO of Kirkpatrick & Lockhart Nicholson Graham. “The other reason it’s important is that these people are doing very important things in key roles now, and you want only the best people in those roles.” (For more on developing future leaders, see “How Stars Are Made,” Page 34.)

At the level they’re at, these almost CIOs have been deputized, and much of the credibility of the CIO actually rests on their shoulders. They manage the majority of major vendor relationships. They are responsible for the success or failure of multimillion-dollar, enterprisewide initiatives. They hire and manage your most critical employees. They act as your surrogate when you’re out of the office. And the best thing is, they do it all very, very well.

Finding such folks isn’t easy. “They need to be good at a lot of things,” says Agnoli. “They have to be able to delve from the really high-level stuff all the way down to the minutiae, sometimes at the same time. It’s a very difficult skill set to find, so you want to hold on to them.”

There are some telltale signs that an IT leader is—or should be—headed for the top. Our 33 Ones to Watch honorees, recognized for their rising-star status in the IT world, display three overarching characteristics the wise CIO will watch out for. They have vision, often taking creative approaches to solving business problems. They exhibit influence, with superior communication skills and the ability to build consensus. And they get things done, executing enterprisewide projects successfully time and time again. Brooks demonstrated all three in turning around the help desk at Arrow, from envisioning the changes that needed to take place to winning buy-in for the planned overhaul to executing it flawlessly. And judges for this award say it’s an all-or-nothing proposition. “Without all three of those traits,” Agnoli says, “it would be hard to make a case for moving (someone) on to the next level of influence.”

What to Watch For: VISION

Vision as a core competency is the kind of trait CIOs *just know* when they see it. It comes in many forms, from the ability to envision an executable plan to figuring out how to enable a new business product. But the qualities that lead IT up-and-comers to creative approaches to solving business problems are easier to boil down. They need a thorough understanding of the down-and-dirty details of both technology capabilities and business needs, the flexibility to adjust to changing conditions in either or both, and the ability to bring the two together into a very high-level strategic plan.

Ones to Watch honoree Gudrun Neumann had been working for IBM for 16 years—most of the last four on the road—when she was assigned to run an intended infrastructure outsourcing arrangement between IBM and American Century Investments. She was pleased; she'd been looking for a bigger outsourcing deal to run so that she could settle down in one place for a little while. Ultimately, American Century Senior Vice President and CTO Robert Sauvageau canceled the deal with IBM, but he saw something special in Neumann and hired her as vice president of corporate services. In 2001, major changes were taking place at the Kansas City, Mo.-based financial services company. Like most mutual fund companies, American Century was hurting from the market downturn and the resulting decrease in fund assets. Senior executives wanted to broaden the company's market base beyond traditional mutual funds to include institutional asset management. In 2002, Neumann was charged with envisioning a systems strategy to support the major shift in business. She employed business process modeling, vendor analysis and competitive intelligence. With all that going on, she says she kept focus by keeping the "simple" problem that she was trying to solve in mind. "Will our systems be able to support the business strategy of the future?" she would constantly ask herself and her team of 230. "If not, what should we do?" Ultimately, they came up with recommendations for business process changes and systems acquisitions, which got unanimous support from her business partners and the executive committee.

Today, Neumann and her team are in the final stretch of the multiyear project (which is on budget and on schedule). The biggest challenge in envisioning the

future, she says, was dealing with the present. "You can create a long-term strategy, but things always change," says Neumann.

Neumann also faced a common challenge—namely, staying on top of the details but keeping an eye on the big picture. "I'm not a micro-manager, but I'm interested in a lot of detail, especially in the beginning phases of something," says Neumann. "It helps me shape the plan and also sell what we're doing, which is 60 percent of what I do." Getting involved in some of the nitty gritty—such as the details of both applications and infrastructure—Gudrun says, actually helps her to identify larger issues.

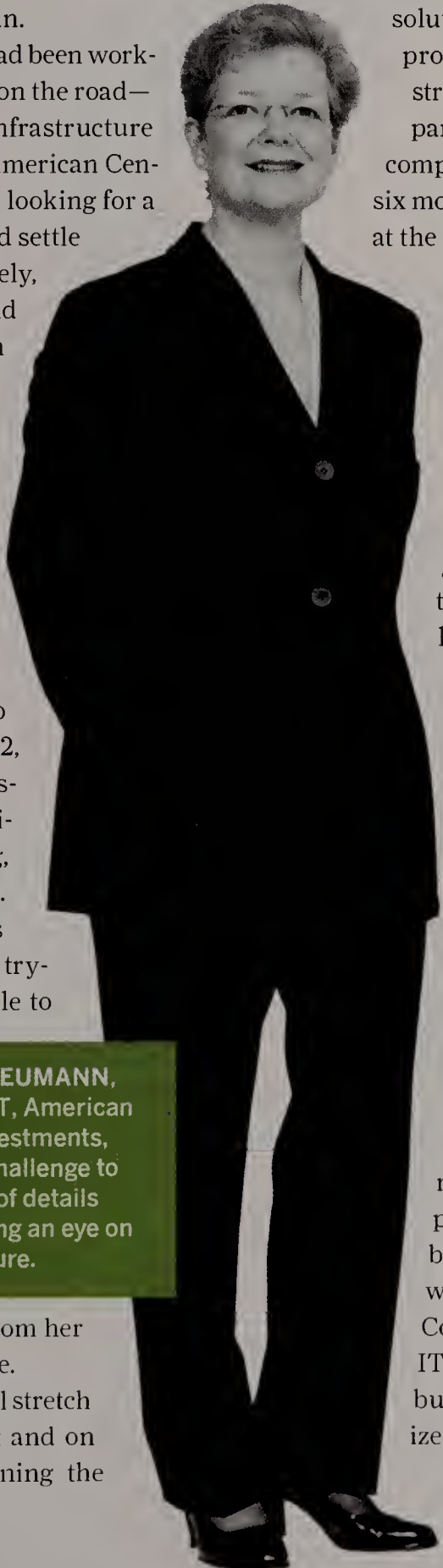
For Ones to Watch honoree Daren Collins, connecting the dots where others cannot is how he's able to envision innovative solutions to nagging business problems using existing or proven technologies. That's how, as director of infrastructure IT for TransAlta, a Calgary-based energy company, he came up with a wireless implementation for the company's plants that saved them \$600,000 in the first six months of operation. Monitoring equipment operations at the company's huge plants had been a problem for some time. The pen-and-paper method was slow and inefficient.

Collins could see a solution by combining existing third-party monitoring software—"cheap 802.11 wireless technology"—and existing laptops to help automate the process. "No one had ever thought of doing it that way," Collins explains. Collins' unique solution worked out better than expected (he had targeted only \$50,000 in savings per month), and he used the increased savings to buy more ruggedized handhelds for plant technicians to use.

He took a similar approach in creating an automated solution for running all the company's power plants. Unlike other, more mature segments of the manufacturing industry, power plants were largely unautomated and still required human monitoring and adjustment to help keep plants up and running. Under Collins' guidance, TransAlta became one of the first in the utilities industry to automate such work. He took a software package from Siemens that had been designed for other types of manufacturing and applied it to the power generation plant. Collins says the automation has increased new production from existing plants by 5 percent per unit.

Collins attributes his ability to envision entirely new solutions from existing pieces of technology and processes to his background as an engineer. "I learned best practices like adopting standards, reusing things when you can and choosing proven technology," says Collins. "And it's starting to catch on across the rest of IT. They used to tease me for not using anything new, but now that they see that these things work, they realize it's smart."

Continued on Page 46



GUDRUN NEUMANN, senior VP, IT, American Century Investments, says it's a challenge to stay on top of details while keeping an eye on the big picture.

Me? Go to a Conference?

A man with dark hair, wearing a white dress shirt and a dark tie with small white dots, is looking upwards and to the right with a thoughtful expression. The background is a solid dark red color.

Short-term view:

It's very hard to take three days out of the office to attend a conference. Long-term thinking sounds great, but I have immediate issues to deal with. Will I get enough actionable ideas to make the time worthwhile?

Long-term view:

How can we meet our short-term needs, while getting beyond the quick-fix mentality, the "live for today" mind-set that seems to dictate how we conduct our businesses, run our educational institutions, and choose our nation's priorities?

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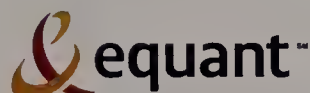
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What to Watch For: INFLUENCE

Of course, giving doctors and nurses innovative new technology tools is one thing; getting them to use these tools is quite another. That's where influence comes in.

Larry Stofko, like all of our Ones to Watch honorees, must call upon a whole host of skills to get business buy-in for, and usage of, IT-enabled change—from being willing to learn more about what the business needs to gaining the trust of key stakeholders to marketing big, enterprisewide changes to building relationships with various (often very different) constituencies. Stofko's ability to keep the new ideas coming has enabled him to "establish himself as an agent of change," says St. Joseph Health System's CIO Ben Williams.

For Stofko, vice president of IT strategy and innovation for St. Joseph Health System, the first step is understanding. The better he can understand the needs of his customers, the easier he can generate welcomed solutions. So Stofko went back to school, earning a graduate certificate in health-care administration. "I did that to get closer to the business side of what we do," says Stofko. "Any technology I bring to the table has to be focused on the health-care delivery, so I have to be able to wear that different hat." It's important for any IT leader to figure out how to influence those in IT and in the business, says Ones to Watch judge and Marriott International Executive Vice President and CIO Carl Wilson. "You have to be trustworthy and able to earn the trust of others who may be doubters."

Stofko surveyed his hospitals to find out what their technology needs were. It turned out that they varied wildly. Some hospitals (such as those in Orange County) were in competitive environments; others (such as the one in Napa) were the only game in town. In some areas, St. Joseph's owned the physicians groups;

in others, it didn't. So Stofko developed a governance process that would not only capitalize on consistency and best practices where it makes sense but also allow for market variation. It wasn't easy. "The challenge is finding a model that works for the inherent control that people desire, balanced with guidelines and processes that put a type of structure and control in place," he says. Stofko was able to strike that balance, and the resulting governance process not only works better for all involved but also helps display to the hospital community Stofko's understanding of their needs, enabling them to trust him even more.

Stofko also has to influence his toughest audience—the physicians. It was easy to get a handful of doctors to come to his monthly noshes, those who were already on the IT bandwagon. But to really influence behavior, Stofko had to get those IT skeptics, with a large sphere of influence themselves, on board as well. So far, he says he has a good group that usually attends the breakfasts or dinners, where he updates them on what's going on in IT and opens up a discussion among the doctors about what's going on in their

markets and what they need. The group was a great help as Stofko launched St. Joseph's first computerized physician order entry system at St. Jude Medical Center in Fullerton, Calif.

Stofko notes that his success with the electronic records system earned him major points to move forward with his multi-million-dollar e-health project. "If you have a track record of success and actually do what you say you are going to do, you will earn credibility that will translate to influence."

Ask Timothy A. Waire Jr. about his accomplishments as manager of IT infrastructure for Constellation Energy Group, a leading energy company in Baltimore, Md., and he'll start talking about his most recent "campaigns." That's because Waire thinks of his IT projects as products and his ability to introduce them to the \$12.5 billion corporation as marketing tasks. Without such effort, he says, IT loses its influence. "If you don't market your ability to deploy real technology solutions that solve real business problems, your role is reduced to that of a spectator, just watching the 'real' business execute its playbook," says Waire.

For any "campaign," the process begins with the business case. Having developed that, Waire holds "lunch and learn" sessions within each business unit or site. "That's when I try to sell the business on the tools by educating them on how it will help do day-to-day business better," explains Waire.

Outgoing by nature, Waire says that sales-



LARRY STOFKO,
VP, IT strategy
and innovation,
St. Joseph
Health System;
and (standing)
**TIMOTHY A.
WAIRE JR.**,
manager of
IT infrastructure,
Constellation
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manship must be in his genes, since he doesn't have any actual marketing background. But he calls on the innate skill during capital appropriations reviews. For every major initiative he wants to implement, even if it's part of the company's business plan, Waire has to build a solid business case. He employs tools such as ROI calculations, internal rates of return and cost-based accounting—although he says his more important task is convincing the business that he can deliver. To do that, he throws out all the acronyms and speaks the language of the business. "Once you have 'sized the prize' for them, you can actually deliver it," Waire says.

What to Watch For: EXECUTION

And that's the final ingredient that makes an IT leader one for the CIO to watch. Yes, vision and influence are essential qualities for future CIOs. But without solid execution, great ideas and successful marketing campaigns quickly fall apart. "You've gotta stand and deliver," judge Wilson says.

It takes time though to truly judge whether an IT leader is good at getting things done. "You have to look at the scope and reach of what they're doing. It's one thing to do a successful project; it's another thing to do it across the entire organization," says Agnoli.

"You also have to look at how successful they are. They need to build a track record over time, not just one good project." To do that, IT leaders need to be able to employ solid project management practices, hire and manage the best employees to execute those plans, and either get involved or delegate appropriately. And though it sounds rather circular, it takes an IT leader who has vision and influence as well.

Collins exhibits all that and more, says his boss. "He has the technical skill to see the vision before anyone else and the trust of the organization to go toward these goals before they are well-understood," said TransAlta Senior Vice President and CIO Greg Wilson when nominating Collins. "He understands the business better than most business guys and understands technology better than anyone in our company."

That's why when TransAlta acquired three companies in New Zealand with the hope of integrating them into one, Wilson's predecessor knew that Collins was the man to send to the other side of the world to get it done. Collins applied his "simple" recipe for solid execution: involving the business, bringing key vendors on site, hiring

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Traits of a True IT Leader

Ones to Watch honorees—those likely to become the CIOs of tomorrow—need to be good at many things. Critical skills include:

1. Fluency in both technology and the business
2. Ability to work at tactical and strategic levels simultaneously
3. Foresight to connect disparate pieces into cohesive solutions
4. Flexibility
5. Commitment to lifelong learning, with a readiness to stretch beyond core competencies
6. Marketing competence
7. Consummate communication skills
8. Ability to find and manage top talent
9. Vendor management expertise
10. Project management excellence
11. Willingness to delegate

—S.O.

people who have previously worked on similar efforts and adopting standard project management practices. It worked. Collins started up the centralized New Zealand IT group from scratch and stayed on for two years to make sure things ran smoothly before returning to Canada.

For Ash Brooks, the key to delivering time and again is to "begin with the end in mind. I'm good at seeing what the end result should look like and designing systematic processes to get to that result." CIO and Ones to Watch judge Agnoli says such execution strategies are key: "It's about knowledge of what you're doing, knowing what should be in that plan and sticking to it. Communication before and after so you can catch problems before they become too big."

In 2002, Brooks (who before his IT career was the manager of a health club and owner-operator of his own automotive shop) was admitted to the executive MBA program at Northwestern University's Kellogg School of Management. At the time, Brooks was based in Arrow's Denver office and commuted to Chicago for classes on every other Friday, Saturday and Sunday, landing back in his Denver office by Monday morning. But at the end of his first semester, the CIO asked Brooks to take over the entire infrastructure organization, which would require him to move to New York. He relocated himself and his family, took on a job triple the size of his previous one and continued with his trips to Northwestern.

Brooks had to learn a new way of getting things done—namely, trusting others. It's a critical and often difficult step as IT leaders rise in the ranks. He also enlisted new forms of communication and measurement so that he could continue to view what was going on throughout the organization, even if he wasn't intimately involved. He adopted an internal project methodology that had previously been used in application development and set up an enterprisewide IT infrastructure scorecard that he began monitoring on a monthly basis.

Brooks had the opportunity to test his newly acquired execution-by-delegation skills when he took over as vice president and general manager of Arrow's military and aerospace line of business, while that business unit leader was on a two-month sabbatical.

And like all of our Ones to Watch honorees, it likely won't be the last chance Brooks gets to test his hard-won leadership skills, either in his current position or someday soon as CIO. **CIO**

Senior Editor Stephanie Overby can be reached at soverby@cio.com.



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33 Rising Stars

The 33 **Ones to Watch** honorees come from a wide range of backgrounds, but all share a passion and a talent for leadership

Ash Brooks, 42,
VP, IT Infrastructure and
Operations, Arrow Electronics



» In just a short time, Ash Brooks has completed several hefty infrastructure projects, all with significant ROI; he has been given charge of Arrow Electronics' vendor management office; and he has instituted a regular benchmarking process for IT infrastructure costs. Brooks supervises 200 IT employees (who in turn support 12,000 end users), and somehow still found the time to earn an MBA with honors. A comment from CIO Mark Settle sums up Brooks' "legendary" multitasking skills: "Whenever Ash commits to getting something done, it gets done."

Michael Carlson, 42,
VP, Business Transformation
and Customer Value, Xcel Energy



» Michael Carlson's most notable accomplishments at Xcel Energy have involved building teams and coalitions. Two examples: His participation was key to the success of Xcel's utility of the future initiative with the company's suppliers. And with his consensus-building skills, he turned around an analysis and reporting process implementation that had previously failed three times, and brought it to a successful conclusion in just six months. "[Mike] builds coalitions horizontally across the company better than anyone I've ever seen, while creating inspired teams within his own organization," says Xcel CIO Raymond Gogel.

Bill Chapman, 51,
Senior VP and CTO, Avnet



» The list of Bill Chapman's accomplishments reads like an index of IT's major themes: alignment, ERP, contract management, systems consolidation, infrastructure integration, Web design. You name it, he's probably done it—and always with significant cost savings and efficiency increases for Avnet. He also holds eight international patents. Yet, CIO Ed Kamins says, what is most compelling about Chapman as a leader is that despite his considerable past accomplishments, "he remains open to all possibilities that might improve his own effectiveness or that of the organization."

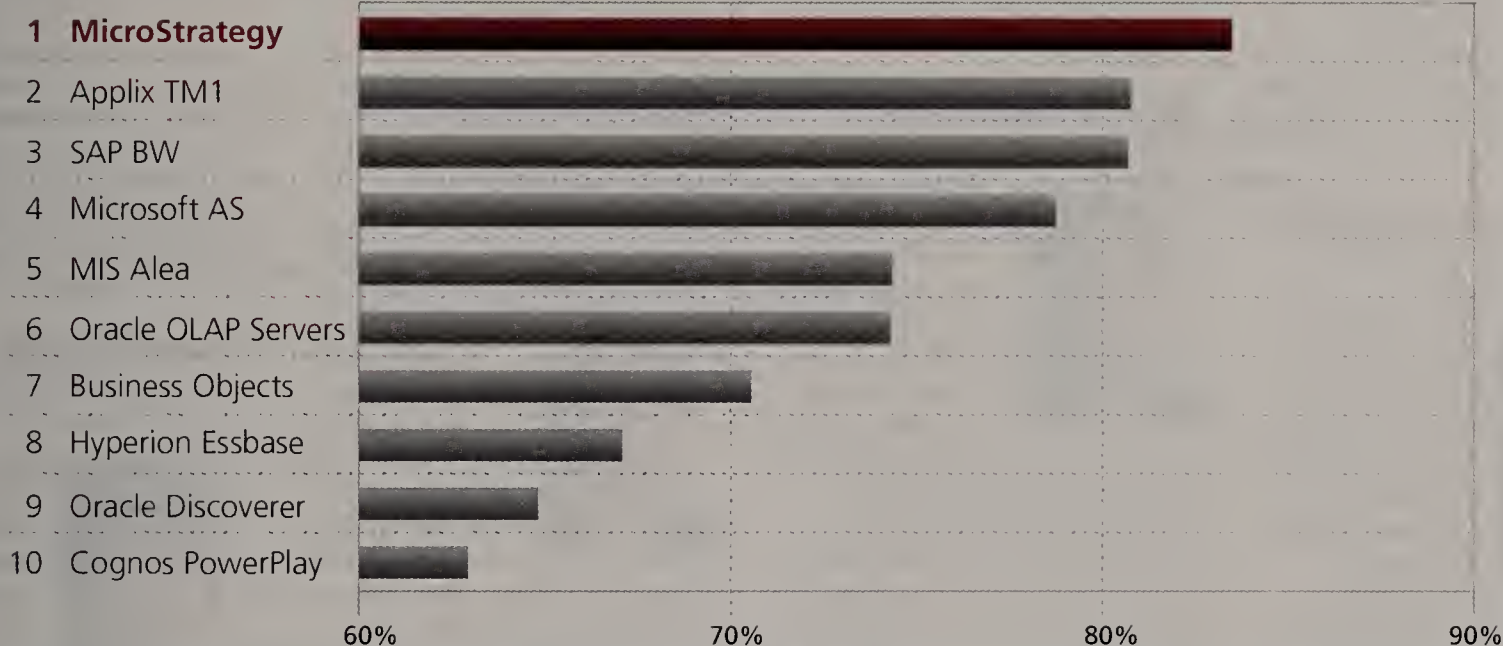
Cheryl Cohen, 43,
Executive Director,
Enterprise Systems,
ManTech International



» A certain amount of fearlessness, in addition to an exemplary work ethic, is required when creating something new. Cheryl Cohen has done that several times at ManTech, starting with the position she now holds as well as the software development and customer service organization she leads—both of which did not exist before her tenure. She also took a moribund ERP implementation and revived it, remarkably completing it on the original timetable—the company's IPO date, no less. And she nurtures a team environment where similar bold action is encouraged and celebrated, says company CIO David Spannare.

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Daren Collins, 43,
Director, Infrastructure IT,
TransAlta



» By keeping himself on the leading edge of IT, Daren Collins has helped TransAlta become an industry leader in technology use. He supervised a

complete redesign of the company's architecture, and he and his group installed process controls, supervisory controls and data acquisition systems, wireless technology, document management and business warehouse systems, and a portal—all integrated seamlessly, and all increasing operational efficiency and reducing costs. No surprise then that Collins has the loyalty and trust of both IS and business leaders, and that TransAlta CIO Greg Wilson calls him his "right hand."

Christopher Crowhurst, 36, VP and Principal Architect,
Thomson Learning



» Patent holder and former researcher Christopher Crowhurst has also been inventive in the way he has employed cutting-edge, service-

oriented architecture to remove technology silos at Thomson and to create an integrated infrastructure that's on track to produce an impressive ROI. He influences not only the company's technology strategy but also its security and risk management practices.

Peg Davis, 45,
Deputy CIO, City of Phoenix



» Municipal budget cuts in each of the past three years have made it necessary for Peg Davis and her telecom services staff to constantly brainstorm ways to survive on less. Her

department's tough approach to contracts, warranties and service-level agreements, and its regular audits, are saving the city of Phoenix more than \$1 million annually while freeing up funds for new initiatives. And under Davis's empowering leadership, the once dysfunctional telecom team now delivers customer-focused and cost-effective services.

Eric Dirst, 38,
VP and CIO, Moving Services and
International Relocation, Sirva



» Eric Dirst's focus on IT projects that deliver business value has gained the respect and confidence of Sirva's business leaders, according

to CIO Ann Harten. Two such projects stand out for their creativity: One is his founding of an IT advisory committee made up of franchise agents that dramatically improved relationships with IS; the other is his development of a client extranet that not only was ahead of similar competitor offerings but was key to doubling the company's relocation business in a single year.

Darren Dworkin, 34,
CTO, Boston Medical Center



» When what's at stake is the uninterrupted delivery of technology services in a medical setting, the term "mission-critical" acquires a whole new meaning.

Darren Dworkin has implemented a number of new systems that solve problems unique to hospitals and combine IT technical understanding and business acumen. One, a real-time electronic "bed board," keeps tabs on how many beds are occupied and the status of the patients in them; another, a secure remote-access portal, enables clinicians to treat patients regardless of location.

Yomi Famurewa, 46,
Former VP, IT Supply Chain and
Design Systems, ArvinMeritor



» "Back office" is not a term that applies to the IT systems that do the heavy lifting at ArvinMeritor. While at the automotive components manufacturer,

Yomi Famurewa constantly looked for technology solutions that would keep the company competitive. Notable among these was a new project management process that improved both customer satisfaction and the success rate of IT projects. Tireless and a quick learner, according to his former supervisor, he changed ArvinMeritor's perception of IT from solutions provider to strategic business partner.

Mary Finlay, 46,
Deputy CIO, Partners
HealthCare System



» Mary Finlay led the effort that redesigned Partners HealthCare's core IS processes, and she is now working to improve its infrastructure

management. Her responsibilities are enterprise IT and major vendor contracts. She started an IT program management office and oversaw the integration of IT staff during a recent merger. She has taken on and turned around a couple of troubled projects. She has also won the praise of CIO John Glaser, who says the numerous awards the IT department has received are the direct result of Finlay's contributions to its leadership and management.

Tony Habash, 38,
Director, IT Strategy,
Planning and Implementation
Services, AARP



» A recognized business leader and change agent, according to CIO John Sullivan, Tony Habash routinely consults AARP's business units and

serves on committees that shape the association's overall direction. When the AARP put together an IT governance process, for example, it was positioned as an enterprise business process. And strategy and planning are also joint IT-business efforts. Although his title suggests that he operates only on the IT side, Habash has clearly helped eradicate the business-IT divide throughout the organization.

Kashif Hashmi, 37,
Codirector/DPM,
State Bank of Pakistan



» It's likely that most IT executives will never have to cope with foreign travel bans that interfere with their ability to hire IT contractors from

other countries. The State Bank of Pakistan's Kashif Hashmi has, however, and he's also had to come up with ingenious solutions to more ordinary problems. For example, he launched an in-house development

division that improved the relationship between IS and the business so much that he won support for a top-to-bottom revamping of the bank's software and hardware infrastructures.

John Heveran, 42,
VP and Functional Information
Officer for Customer Relationship
Management, MCI



» From day one at MCI, John Heveran established himself as a go-to person and tireless problem solver. Hired to take over a troubled project—a new tele-

marketing platform that was beginning to look impossible to implement—he finished it under budget and ahead of schedule. He's continued to take on and successfully execute large and complex projects—for example, a global sales force transformation that involved 10,000 users worldwide and the launch of a new business unit in a record six weeks.

Deborah Judy, 46,
Manager, IT Value, United States
Postal Service



» Businesses talk about "IT value," but the USPS is one organization that's doing something about it, in the person of Deborah Judy. For example,

she has implemented a set of tools that allow the IT department to establish standard, repeatable processes that manage time and cost information, and she has created an integrated solutions methodology that is a lifecycle framework for developing, implementing and tracking IT-business solutions. So, even as the IT department helps the USPS function better, Judy is helping the IT department function better.

Raymond Karrenbauer, 36, CTO, ING Insurance Americas



» Integration, alignment, change—many companies have a tough time realizing even one of these requirements for success. Not so at

ING Insurance Americas, where Raymond Karrenbauer's dedication to alignment and his strategic, enterprise-based technology outlook have

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won him the company's admiration as an innovator and change agent. He deserves his company's applause: A multiyear enterprise information infrastructure project he facilitated resulted in a 20 percent reduction in regulatory compliance costs, and a data consolidation across ING's divisions resulted in substantial improvements to customer service and sales.

Mark Kiernan, 39,
VP, Production Operations,
GMAC Commercial Holding



» Often technology problems are, in reality, people problems. Mark Kiernan gets high marks from GMAC for how he handles IT vendors and

manages the IT strategic process. He's earned even warmer accolades, however, for his adeptness at handling staff, and for his measured approach to solving problems. When the company telecom group experienced morale problems and lowered productivity, for instance, a voice-over-IP project seemed doomed to fail until Kiernan turned around the project—and its staff too.

Pradeep Kumar, 50, VP,
Application Development, APL



» A colleague at APL says that Pradeep Kumar is respected and sought out because his solutions to business problems are both practical

and valuable. Key to Kumar's approach is simplicity: He simplifies the design of previously troubled projects, and they become doable. And he builds agility into his own software projects, such as a financial system that created a one-day close for APL, a multinational company with 300 offices. His team is deeply loyal to him, and competition for open positions in his department is keen.

Leslie Lambert, 45,
VP, IT Service Management,
Sun Microsystems



» Leslie Lambert's focus and direction were key to the rescue and successful completion of Sun Microsystems' stalled portal proj-

ect. And she also had a hand in structuring the information and applications that populate the portal. As the leading IT business partner for Sun's finance organization, Lambert is at the forefront of the discussion of IT's business value at the company. And she has been a role model at all levels, "demonstrating the kind of poise, executive presence and concern for 'doing well by doing right' that are the hallmark of a great leader," says CIO Bill Vass.

Kim Langford, 50,
Director, Road User Safety
Application Solutions, Ontario
Ministry of Transportation



» While the Ontario Ministry of Transportation's mission is to save and protect lives, Kim Langford's mission is to make sure that the

ministry's systems deliver critical information reliably and on demand. He carried out a massive upgrade and overhaul (34 subprojects in all) that stabilized those systems. And he's stabilized his department's application development process, instituting methodologies to ensure that mistakes happen only once. Langford's supervisors regard him as an exemplary IT leader, one whose vision and tenacity inspire his staff to top-notch performance.

Robert Machen, 36,
VP, Corporate and Brand
Solutions, Hilton Hotels



» The story of how Hilton Hotel's guests got high-speed Internet access is only one example of Robert Machen's skills. When he took

over the project 18 months ago, it had been stalled for several years. Machen negotiated the necessary technology and service contracts; in the process, he saved Hilton more than \$10 million in deployment costs, making possible \$2 million in ongoing annual savings. Today, guests in more than 2,200 hotels have high-speed Internet, and Hilton has a new revenue stream. CIO Tim Harvey calls Machen a charismatic and savvy businessman, whose input is valued by the company, as is his ability to ensure that IT resources deliver on their promises.

Cheryl Monroe, 52,
Senior Director, Global IT
Operations, Align Technology



» Four years ago, the hub of Quantum's then hub-and-spoke operational structure was sold. Potentially a disaster for remaining company offices,

the sale resulted instead in the creation of a global team, says Quantum CIO Scott McIntyre. He gives the credit to Cheryl Monroe, who during her tenure at Quantum created the template for a distributed organization and won enthusiastic buy-in from managers in 11 locations. Then, a first-ever partnership between IT, legal and purchasing reduced vendor-related operations costs by 60 percent. Monroe, who is now at Align Technology, was known for leading change but also for leading the acceptance of change.

Gudrun Neumann, 45,
Senior VP, IT,
American Century Investments



» Gudrun Neumann has chalked up an impressive record of IT excellence because she understands that IT can be best in class only when it aligns

with business needs. She created a program to educate American Century's top 150 managers about what drives IT expenses, and IT costs went down 40 percent in just over two years. She transformed the company's technical disaster recovery plan into a companywide business recovery plan, which functioned perfectly in the summer 2003 blackout, says CIO Robert Sauvageau, thanks in part to Neumann's calming and reassuring influence—another mark of a good leader.

**Max Rayner, 44, VP, Systems
Architecture, Salesforce.com**



» With an MBA from UCLA and a computer science degree from Dartmouth College, Max Rayner has the well-rounded background today's

CIOs need. During a career at Sun Microsystems and now at Salesforce.com, Rayner has led dozens of mission-critical projects. He was chosen by CEO Marc Benioff to join the company's strategy committee

and was tapped to participate in Sun's leadership conferences, normally an honor reserved for business executives. He has stood in for CIO Jim Cavalieri in a number of situations—including reporting before the audit committee of the board of directors, and representing the company with major vendors, partners and customers.

**Kay Sallee, 41, General
Manager, Enterprise Information
Services, ConocoPhillips**



» Mergers and acquisitions always pose dicey IT challenges, but CIO Gene Batchelder says that Kay Sallee was a key factor in the suc-

cess of the integration between the IT departments of Conoco and Phillips Petroleum. Sallee is in charge of 60 percent of the IT budget, staffing and services. Batchelder describes Sallee as a "can do" leader whose spirit and energy infuse her organization. Batchelder says she brings a culture of openness, global thinking and diversity to her role.

Chuck Scoggins, 45,
VP, OnQ Customer Solutions,
Hilton Hotels



» When CRM became a major focus for Hilton Hotels, CIO Tim Harvey says Chuck Scoggins assembled a team that improved CRM

features to the point at which its "share of wallet" from best customers increased from 40 percent to 60 percent. Under Scoggins' leadership, uptime for Hilton.com has gone from 85 percent to more than 99 percent, while the budget was cut from \$8 million to \$6 million. Requests for business intelligence, which used to be handled manually and could take weeks to obtain, are now available online within minutes.

Dale Slaughenaupt, 33,
Deputy CIO, BEA Systems



» CIO Rhonda Hocker lauds Dale Slaughenaupt for his crack project management skills and focus on cutting-edge IT advancements.

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He was in charge of BEA's transition to service-oriented architecture (SOA), changing BEA's formerly inefficient legacy environment to a seamlessly integrated system with clear standards, visible services shared across the enterprise, a lower cost of ownership and a reduced risk. By building an SOA, BEA decreased its project release time from a year or more to just a few months. Hocker says Slaughenhaupt's continued delivery of innovative and well-executed projects speaks volumes for his work ethic, experience and leadership.

Kevin Smith, 46, Director of Business Operations in IS, Intermountain Health Care



» Kevin Smith was brought to IHC specifically to help transform the IT organization. He is lauded by a user for doing just that. With a back-

ground as both a CEO of a technology company and a consultant, Smith has a unique view of how to better serve IHC's internal and external customers. And he thinks big. One of his most significant accomplishments has been managing a joint software creation and distribution agreement with a Fortune 100 company, a partnership that will save both companies more than \$100 million in development and management costs. He is described as possessing the rare ability to work as a key change agent while engendering trust and loyalty from those he works with.

Judith Spitz, 50, Senior VP of Network Systems, Verizon IT, Verizon Communications



» CIO Shaygan Kheradpir says that when Judith Spitz assumed her current role, the network systems organization was suffering from low

morale and a decline in productivity. Within three months, the organization had turned around. One of her biggest challenges was developing an e-business strategy that delivered more than a dozen portals and transactional systems, including the company's e-procurement system, within two years. She also served as an IT leader on Verizon's enterprisewide initiative, the building of a new fiber-to-the-premises network. This effort led to the successful delivery of more than 40 systems in 40 weeks and massive operational efficiencies for the business.

Larry Stofko, 41, VP, IT Strategy and Innovation, St. Joseph Health System



» CIO Ben Williams says that Larry Stofko's background as a consultant and his graduate certificate in health-care administration have made it possible for

him to "envision realistic IT innovations within the industry." Stofko can point to success with the Holy Grail of the health-care industry—electronic medical records. More than 700 physicians and staff are now using the new system, moving from a system that was

once completely manual. In September, more than 1,300 patients using Vioxx were identified and proactively notified of the medication's recall. Previously, it would have been impossible to manually search thousands of patient charts.

Timothy A. Waire Jr., 36, Manager of IT Infrastructure, Constellation Energy Group



» Timothy Waire is responsible for the development and maintenance of systems that are core to supporting the energy commodities business. He has led

improvements to the company's data centers as well as its strategy for remote offices. And he has some hands-on disaster recovery experience, leading recovery efforts for a line of business that was forced to vacate its headquarters for a three-week period after Hurricane Isabel. Due to extensive flooding caused by the storm, this required setting up core business technology in less than 72 hours for more than 300 energy commodities personnel.

Rusty Yeager, 42, VP and CTO, HealthSouth



» CIO Randy Carpenter calls Rusty Yeager his "field general" and says that as a trained health-care administrator, Yeager truly understands the end user. Yeager, a

lieutenant colonel in the U.S. Air Force Reserves, has implemented a new support center approach that has reduced the call abandonment rate to less than 20 percent, increasing customer satis-

faction. He also led a restructuring of the telecom department, producing an overall \$7 million in savings. Carpenter pays Yeager the highest compliment, saying he relies on him, "whether it is for a boardroom presentation or a new technology implementation."

Shadman Zafar, 34, Senior VP, Architecture and eServices, Verizon Communications



» CIO Shaygan Kheradpir calls Shadman Zafar a "key change agent" both internally and externally. He credits Zafar with successfully leading a

modernization of the IT structure and with skillfully participating in the support of a broad range of functions—including R&D, architecture, infrastructure, procurement, contract negotiation, and application development. Kheradpir credits Zafar with rescuing a severely delayed platform development program for an operations support system, saying that Zafar and his team jumped in and were able to turn the situation around, reversing previously mistaken decisions through consensus building.

What's Hot Online

ONES TO WATCH SURVEY RESULTS

We asked the honorees of the Ones to Watch awards questions about training, leadership and mentoring. Do most of them have MBAs? Were stretch assignments or mentoring more important to their progress? To read the answers, follow the link at www.cio.com/071505.

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The Judges

All the nominees were critiqued by two members of our distinguished panel of judges.

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Lynn Caddell*
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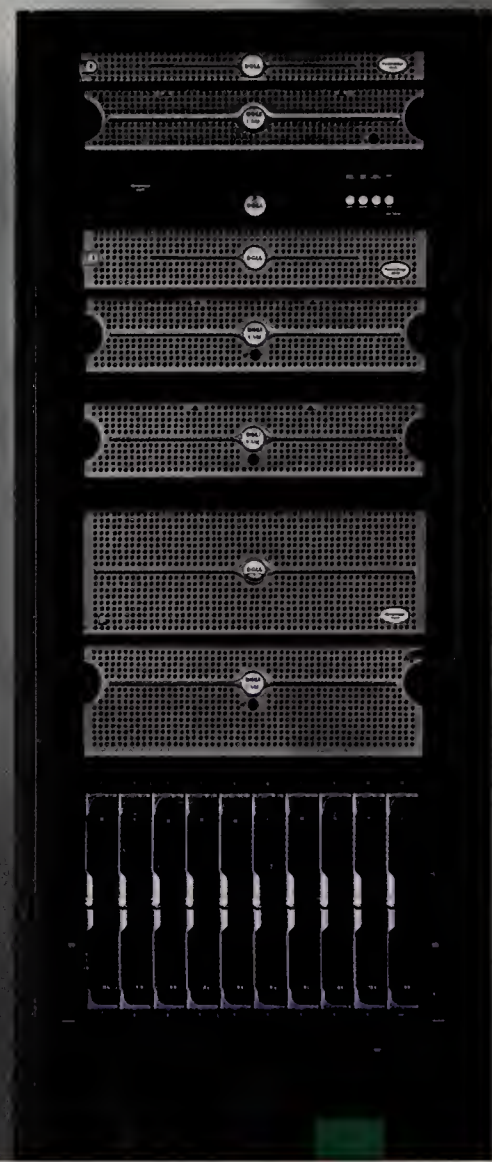
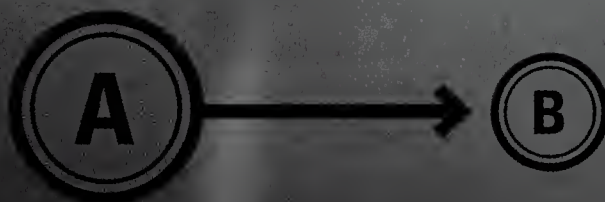
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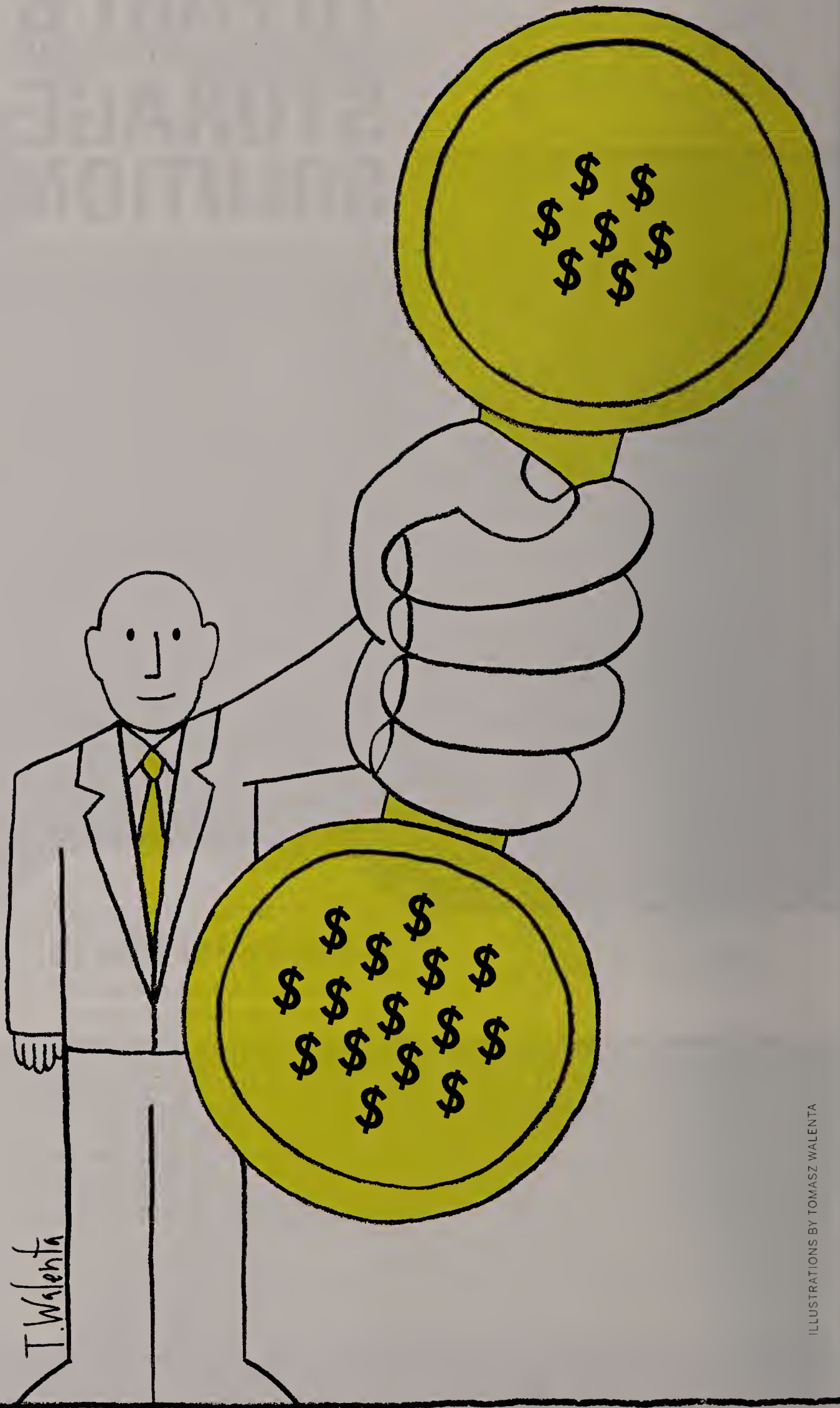
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ILLUSTRATIONS BY TOMASZ WALENTA

WAKE-UP CALL

How to transform your call center from a budget drain into a source of competitive advantage BY ALICE DRAGOON

Not long ago, agents in the call center of a well-respected global Fortune 50 company endured the weekly distribution of the bathroom-time bar chart, a graph showing how long each of them had abandoned his phone to visit the loo. If an agent's bar exceeded the benchmark for his call center, he'd hear about it from his supervisor at his next performance review. When call center consultant Lior Arussy handed the disbelieving CEO a copy of one of the bar charts, he jokingly recommended to the executive that the business services company install infrared sensors to detect when agents left their seats.

Once the embarrassed CEO looked at the numbers, he got the message that running a call center as a pure cost center not only produces a sweatshop environment for agents, it's also bad for business. Pressure to minimize costs was translating into pressure on agents to get customers off the phone as quickly as possible. As a result, close to 50 percent of new customers were bolting for competitors within six months.

"The company was leaving money on the table," says Arussy, the CEO of Strativity Group and author of *Passionate and Profitable*. "Using very, very conservative estimates, 25 percent of revenues a year were essentially lost because the company was not focusing on customers, but instead focusing on efficiency." The company is now implementing a service-oriented architecture that will give agents quicker access via the Web to the information they need to provide better, faster service. What's more, the CEO has come to view his call center as a gold mine of customer information. He started listening to calls himself and now requires senior executives to do the same. What they've heard has spawned ideas for operational changes that have cut costs and increased revenue.

Reader ROI

- :: How call centers can be a valuable source of business intelligence
- :: Why call centers need to balance efficiency with service
- :: How companies are empowering agents to meet customers' needs

This company's blind spot about its call centers is unfortunately not that rare. The temptation to outsource the call or contact center is understandable, and companies are increasingly giving in to it. According to a December 2004 JupiterResearch survey of U.S. contact center employees, 28 percent of respondents outsource some or all of their contact center operations. Dimension Data's "2005 Global Contact Centre Benchmarking Report" puts the number of companies globally that outsource at least one of their call centers at 20 percent, up from 14 percent last year.

But viewing the call center as a pure cost center is a huge mistake. Although expensive to run (annual operational costs hover between \$80,000 and \$120,000 per agent, according to Jon Anton, director of benchmark research at Purdue University's Center for Customer-Driven Quality), the call center also represents the public face of your company. A well-run call center can significantly increase customer loyalty—and a poorly run one can prove a major liability. A Purdue University study found that the average repurchase rate for products that work as advertised is 78 percent. But the repurchase rate jumps to 89 percent when customers have a problem with a product that's successfully resolved through a positive call center experience. Conversely, the repurchase rate plummets to 32 percent when those customers have a lousy call center experience. If that's not enough to convince you that your call center is strategic, the fact that it's a potential wellspring of customer intelligence should.

As the Fortune 50 CEO discovered, it is entirely possible to transform a call center from a cost center into a source of competitive advantage. Doing so requires striking the right balance between operating efficiently and providing great service—as well as empowering agents with the training and information to meet customers' needs. An effective call center strategy should include well-defined processes for capturing and sharing customer information. And depending on the nature of calls coming into the call center, it might include a healthy dose of carefully applied self-service technology and even some offshoring. No matter what, an effective

call center strategy recognizes the long-term value of customers and doesn't skimp on customer service in the name of short-term cost cutting. Here's a checklist of six best practices that can help you transform your call center into an engine of value creation.

1. Balance efficiency and service.

Walk into almost any call center and the first thing you'll see is a huge electronic billboard flashing statistics such as caller wait time, call abandonment rate and average call duration. "That tool put in front of agents screams, 'Come on, rush it! We don't have time! This is not about the customer, it's about closing cases!'" says Arussy. "When employees see those numbers constantly running, it puts tremendous pressure on them to rush customers instead of trying to build a relationship." Customers whose needs aren't met, however, generally won't put up with shoddy service. "If you're not providing a very good service level, customers will call through again, and you'll end up with more call volume because you did not resolve the query the first time," says Michele M. Crocker, vice president of distributor services for Herbalife, a weight-loss, nutrition and personal care products company.

Surprisingly, good service doesn't always mean longer talk times. When Judy Nelson, first vice president of Merrill Lynch Global Private Client Services, instructed the 700-plus agents at the two call centers she manages to focus on solving clients' problems instead of worrying about call duration, customer satisfaction increased on average 5 percent to 6 percent. And the average length of calls actually *declined* approximately 5 percent. "The directive to spend as much time as we need to solve the client's issues made me

feel great coming to work for Merrill Lynch because I knew they really cared about the client," says veteran agent Paul Keller.

2. Measure quality as well as speed.

Herbalife and Merrill Lynch know they're hitting the right balance between good service and efficiency because they go beyond broadcasting efficiency metrics on a billboard and measure the level of service their agents provide. The number that Herbalife's Crocker is most concerned about is first-call resolution—whether a distributor can get all of her needs met in a single call, ideally without being transferred.



Merrill Lynch measures customer satisfaction for every call handled by an agent. As soon as an agent ends a call, the interactive voice response (IVR) system automatically asks clients to rate their service experience on a scale of 1 to 7. Anyone who assigns a score of less than 5 is offered the opportunity to be transferred directly to a supervisor. Whether or not clients choose to talk to them, supervisors listen to each call ranked 5 or lower. And every week, Nelson sends a memo with client survey scores to everyone in the call center.

Other call centers collect quality data online or through e-mail. At Creative Labs, makers of the Zen Micro MP3 player and other electronic toys, Associate Director of Services Steve Lamberti says that a statistically significant sample of customers who contact the call center get an e-mail survey asking them to rank such things as the quality and value of the call.

Once you've collected data on both efficiency and service quality, you can help institutionalize the appropriate balance between the two by developing a scorecard for agents that weights both accordingly. At McKesson Specialty—where call centers handle calls for

the interaction was appropriate and succinct from the caller's perspective, as one of the most important metrics. McKesson relies on Witness Systems to both record calls and capture an agent's keystrokes. "We look at not only whether the agent's demeanor and approach in handling the verbal portion of the call was appropriate, but were they leveraging tools and technologies and entering data points," says Glover. For example, supervisors can see if agents are efficiently accessing the information they need to address customers' needs and whether they are entering all relevant data properly in the CRM system.

3. Coach agents to succeed.

The practice of recording and monitoring calls may seem Big Brotherish, but it's actually a highly effective tool for coaching employees, according to Purdue's Anton. Most call center supervisors will randomly listen to five to 10 calls a month per agent; the best supervisors look for things the agent is doing well to encourage repetition of those best practices. It's also possible to flag

sit next to their buddies for the first month. "We have an open environment instead of closed-in cubes," says Crocker.

4. Put customer data at agents' fingertips.

Giving agents access to customer information may seem elementary, but it's harder than you might think to pull off. According to a study by Arussy's Strativity Group, the average agent needs to access five to 10 different legacy systems including old AS/400 applications, which means customers must wait 30 to 40 seconds while the agent tracks down relevant data. Although many companies are loath to invest in upgrading call center technology, the good news is that they don't need to trash their legacy systems, says Arussy. A Web-based user interface can give agents easy access to data residing in multiple legacy systems.

Coca-Cola Enterprises, for example, is piloting a Web-based GUI known as Boss that lets agents view customer data in some 30 different AS/400 databases. "The Boss

"Call centers have got to keep an eye on the bigger picture. Technology tools can help—if you're ready to use the data."

—BRAD CLEVELAND, PRESIDENT AND CEO OF THE INCOMING CALLS MANAGEMENT INSTITUTE

pharmaceutical companies from patients who need help paying for their prescriptions, as well as from doctors and pharmacists—employees are assessed on whether they're taking calls when they're scheduled to do so, their average call handling time and their quality scores. Those who are high performers in all three areas earn a differential—an additional \$1 to \$2 per hour on top of their regular hourly rate. Lori Glover, director of call center operations for McKesson Specialty, says she views the quality score, which gets at whether

"outlier" calls—those that are much shorter or longer than average and thus are more likely to include a coachable moment. Merrill Lynch does this and takes the added step of having a third-party organization listen to a sampling of calls, looking for things such as how well the agent pulled up relevant information, the level of confidence in the agent's voice, whether the agent articulated and answered the client's question appropriately, and whether the agent had intelligence in his voice. Supervisors find this a particularly useful tool for coaching new employees.

At Herbalife, Crocker taps in to the expertise of more senior agents by having them serve as "buddies" to new agents. New hires will first sit with their buddies to listen in on calls; when they start on the phones, they

application gives agents immediate access to all data as if it were sitting in one place," says Nita Pennardt, vice president of Coca-Cola Enterprises' customer development center, which handles account management and customer support calls for restaurants and other establishments that serve Coke. "From the front Boss screen, agents can see the most recent 100 transactions we've had with the customer, and they can look at it by sales transactions, customer support transactions or equipment service transactions—or they can see all three. Even the last transaction made two minutes ago shows up if the customer has to call right back."

Pennardt says agents love Boss because if a customer previously called for service on her fountain equipment, the sales rep will

know that and can ask her if the issue has been resolved before launching into a sales pitch. "Before we had Boss it was very cumbersome for agents to get to all of that data," she says. Speedy access to customer data has vastly improved agents' efficiency as well. Pennardt says that productivity increased 76 percent after implementing Boss, with the number of transactions customer support reps were handling per day shooting from 58 to 102. "In addition to enhancing productivity, Boss brought a major boost to employee morale by making our agents' jobs much easier," she says.

Boosting agents' morale can have a huge impact on their ability to serve customers well. "Everyone knows if your agents are not happy, they're not going to make customers happy," says Pennardt.

5. Approach self-service from the customer viewpoint.

As anyone who's ever found themselves stuck in a poorly designed IVR system knows, it's all too easy for companies to deliver a rotten self-service experience. But if it's applied properly, self-service technology can be a highly efficient way to give customers the information they need in a hurry. The key, says Arussy, is starting with the goal of saving *customers* time and effort rather than just trying to save the company money. Companies should, for instance, make it easy for customers to opt out of the IVR system to speak with a live agent if they need help; hiding that escape route might cut back on the number of calls agents must answer, but it's not worth the price of customer frustration.

You also need to consider whether the transaction you're trying to automate is, in fact, a good candidate for automation. Enzo Micali, senior vice president and CIO of 1800flowers.com, says his company has never used an IVR system to take orders. Choosing flowers, after all, is a subjective experience, so customers either want to talk it through with someone or see a photo of the arrangement online. The company does, however, use an IVR system to let cus-

tomers check on the status of orders.

At Merrill Lynch, an astonishing 87 percent to 92 percent of calls to the call center are handled through an IVR system. But the kinds of information that callers want—stock quotes, account balances and such—are well suited to automation. John Killeen, CTO of Merrill Lynch's Global Private Client Group, says that during the past five to 10 years, the increase in automation has

Is Outsourcing out of the Question?

Some call center functions are better left in-house; others are not

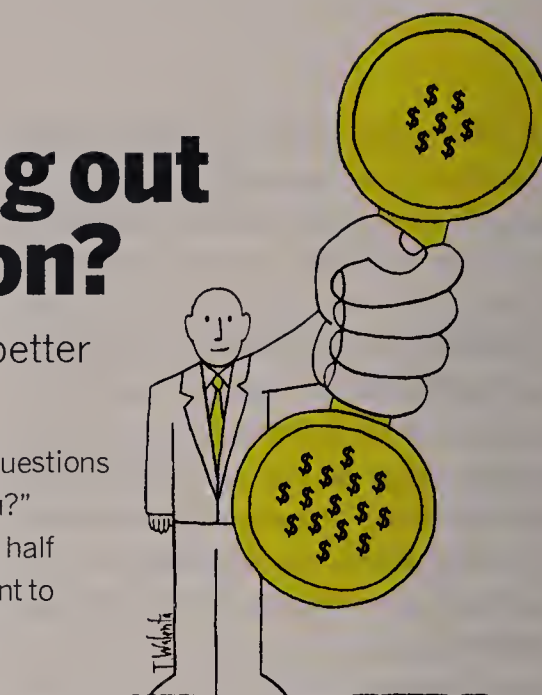
Were David Letterman to do a top 10 list of questions call center agents get asked, "Where are you?" would rank high on the list. And he'd only be half joking. Increasingly, customers really do want to know if they're being served by an offshore provider. "These days, if customers pick up the phone and the agent sounds not quite

American, they may get upset," says Chris Selland, principal analyst at Covington Associates. Dell, for instance, ran into resistance from some customers when it outsourced support calls to India. The company ultimately decided to pull support calls for large enterprise customers back in-house.

Steve Lamberti, associate director of services at Creative Labs, sees the fact that his company keeps all support calls in-house as a source of competitive advantage. By answering its own phones, Creative Labs is in a position to get a good handle on customers' problems and pick up on ideas to improve its products.

But that's not to say that outsourcing or offshoring is inherently bad. It really depends on your business goals and the type of call in question. "Some calls are not of any value in terms of building brand," says Jon Anton, director of benchmark research at Purdue University's Center for Customer-Driven Quality. If a call is basic and transactional and offers no opportunity to win points with customers, it might make a lot of sense to farm it out to offshore providers, who can handle it more cost-efficiently. Calls to Sprint to activate new cell phone services are an example of what Anton calls a very low relationship-building call.

Of course, as with any outsourcing agreement, you've got to carefully select your outsourcing partner, make sure you spell out the details of things like service-level agreements, and proactively manage the relationship. And you have to be extra vigilant about making sure agents are properly trained in how to handle callers and what information to collect, and designing processes for sharing actionable intelligence. "A lot of companies think they can just hand calls over to the outsourcer and it will go fine," says Brad Cleveland, president and CEO of the Incoming Calls Management Institute. "But that's not the case. Above all else, you've got to do your homework and really be involved in the relationship. It's not just something you turn over." —A.D.



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Customers who dial 1-800-MERRILL speak an identifying code and are presented with dynamic menus based on their relationship with the company. The system offers "barge-in" capability, meaning that callers can interrupt the prompts at any time to get directly where they need to go.

When piloting the IVR system, Merrill Lynch invited some more-frequent callers to try it out. Client feedback helped the company fine-tune the system to make it intuitive, choosing natural-language English instead of financial services jargon and avoiding automating things that might irritate clients. Today Merrill Lynch's IVR system efficiently handles most of the frequently asked questions—it actually dispenses stock quotes faster than agents can—and Merrill Lynch saves rep talk time for more complex client questions, making agents' jobs more interesting.

In many call centers, agents simply absorb or deflect blame and then get rated on how well they handled the call. The cause of the customer's complaint goes no further than the agent's screen, and the company misses out on an opportunity to address the issue.

When a caller opts out of the IVR system to speak with an agent, skills-based routing ensures that the agent is qualified to answer questions associated with that branch of the system. The agent can see on her screen where the caller exited the system and thus understands the context for the customer's question. Agents also have cobrowsing capability, so they can, for instance, remotely help a client set up bill payment.

One caveat about overautomating is the danger that you'll forfeit opportunities that could be capitalized on in a live call, says Arussy. For example, banks often try to push customers to make address changes via the Web. Yet in doing so, they're forgoing the chance to ask whether customers have new financial needs associated with their move. The irony, says Arussy, is that many of those same banks are spending money to acquire lists of people who have just bought new houses to try to sell them mortgages.

6. Capitalize on customer intelligence.

■ In many call centers, agents simply absorb or deflect blame and then get rated on how well they handled the call. The cause of the customer's complaint goes no further than the agent's screen, and the company misses out on an opportunity to address the issue. And whether callers are irate, neutral or happy, companies are crazy if they don't mine the call center's constant flow of customer feedback for ideas for product and process improvements, new product brainstorming and even competitive intelligence.

Shockingly few call centers do a good job of both collecting customer data and then sharing actionable intelligence with other parts of the company that could capitalize on it. "Quite a few call centers are capturing various usable bits of information," says Brad

Cleveland, president and CEO of the Incoming Calls Management Institute. "But only 10 to 15 percent both capture the information and have a process in place to share it on an ongoing basis with other departments."

Creative Labs has a decidedly low-tech but highly effective process for capturing insights from the contact center and sharing them throughout the company. According to Lamberti, an analyst will watch for trends in calls and contacts around a new product (like the Zen Micro, which Creative Labs introduced before the 2004 holiday season), delving down into calls, e-mails and Web-based support-forum contacts to draw out information about problems. "It's a manual process," says Lamberti. "There's no pretty way to do that." The analyst creates tick sheets to track the number of contacts per product as well as the top five to 10 issues that customers are calling about. The information is then compiled into what Lamberti calls "an ugly Excel report"

and e-mailed to other departments.

Although he'd love to be able to push a button to share new-product reactions with other parts of the company, Lamberti says that it's critical to have a person on the front lines frame the data correctly first to avoid "sending product managers and engineers on a wild-goose chase." This closed-loop reporting process helped Creative Labs quickly pick up the fact that because the Zen Micro system didn't have a default language, some English-speaking customers were inadvertently setting up their MP3 players in a language they didn't understand. Within a week, Creative Labs initiated a user-installable firmware upgrade making English the default language.

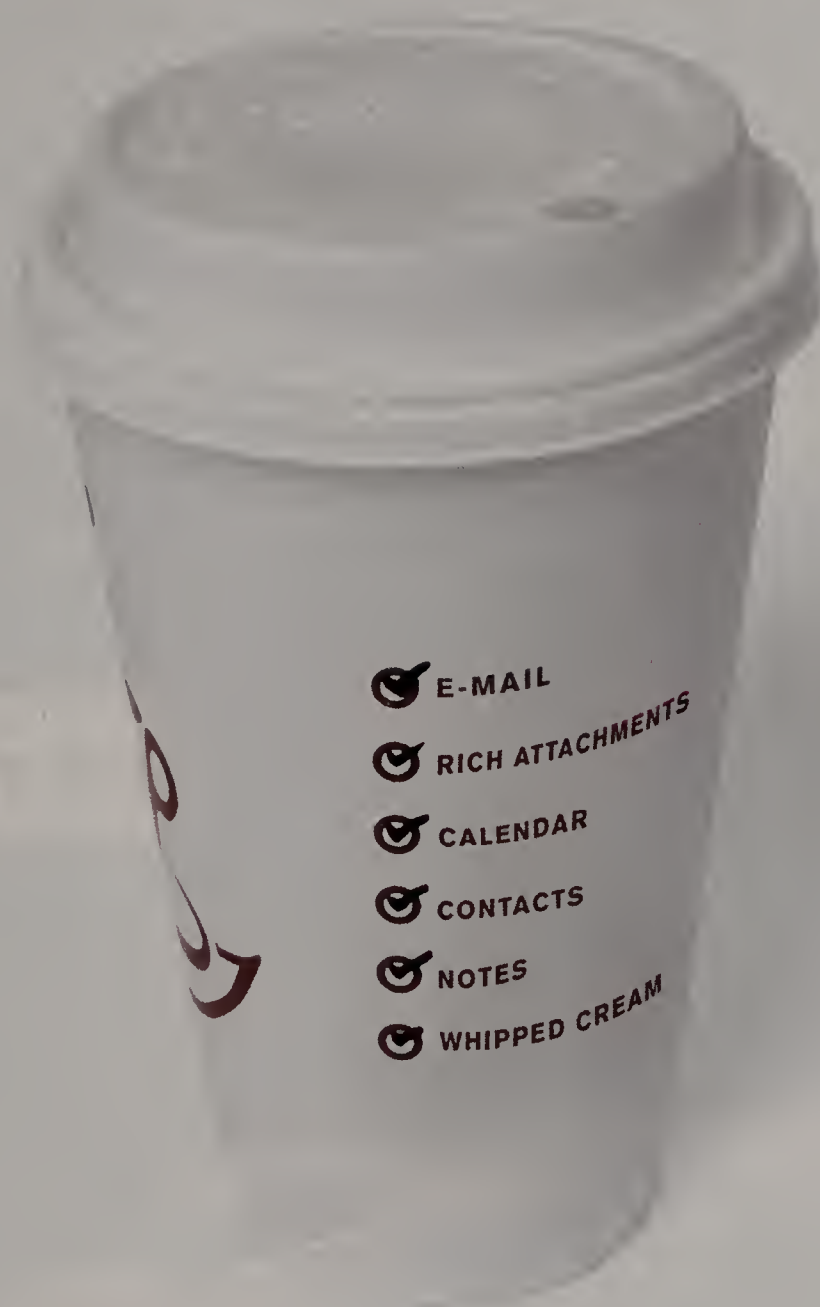
But Lamberti's wish for a more automated way to mine call center data is not that far-fetched. Vendors such as Nice Systems are eager to help companies tap in to their once-inaccessible gold mines of call center information and have scurried to add business intelligence functionality to their product suites. In addition to offering data mining and analytics, they're enabling such capabilities as emotion detection and talk analysis. So it's now possible with such software to zero in on calls with angry customers or rude agents by scanning for raised voices or interruptions. It's also now feasible to, say, flag calls that include hot-button words or competitors' names.

Companies are only just beginning to look at how they can use these new technologies to harness the wealth of data their call centers collect each day. But the sooner they start viewing their call centers as critical sources of business intelligence, the better. "Companies ought not to wait to have the latest, greatest technology to begin sharing data," says Cleveland. Instead of merely handling calls efficiently, call center managers need to start thinking like consultants as well, helping the company identify opportunities to improve and grow the business. "Call centers have got to keep an eye on the bigger picture," he says. "Technology tools can help—if you're ready to use the data."

If you're not ready to listen to your customers, your competitors might very well be. **CIO**

Senior Editor Alice Dragoon can be reached at adragoon@cio.com.

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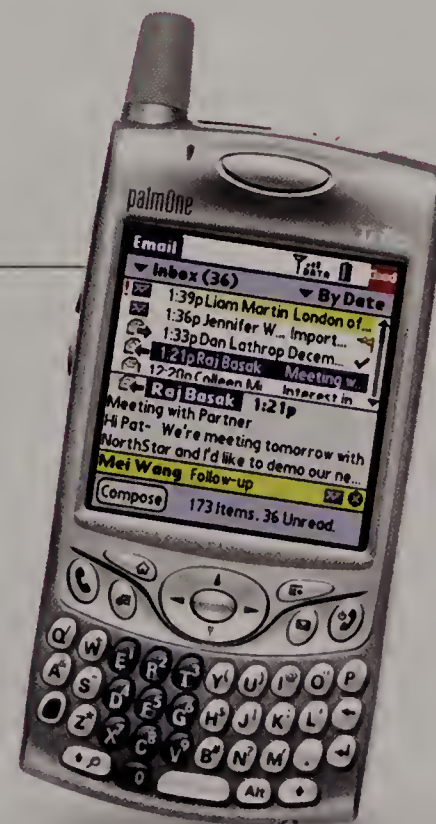


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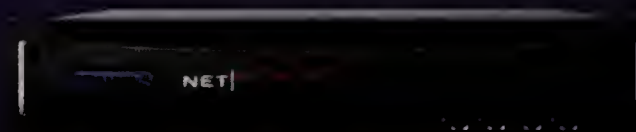
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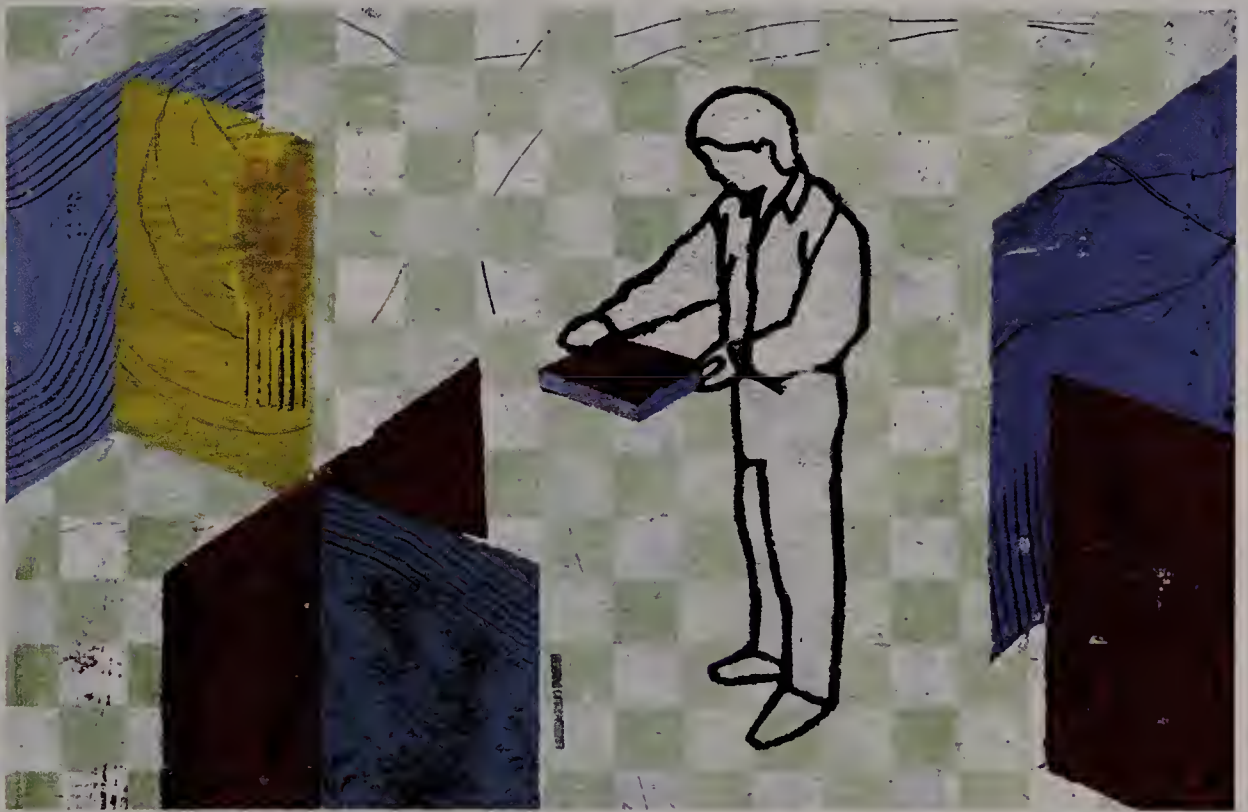
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Edited by Christopher Lindquist
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Museums lead the
way to pervasive
computing

Magical History Tour

BY MICHAEL FITZGERALD

UBIQUITOUS COMPUTING | One of the neatest tricks in all the Harry Potter novels is the Marauder's Map. Armed with this magical tell-all, wizard-in-training Harry could see the whereabouts of anyone inside the Hogwarts school. And thanks to some clever technology, visitors to several Smithsonian museums can take advantage of their own magical map.

Through the use of wireless handheld devices, visitors to the Smithsonian Information Center at the Castle, the National Museum of American History, the National Postal Museum, and the National Air and Space Museum's Udvar-Hazy Center can track their progress through the exhibits. (A fifth museum, the National Museum of Natural History, is slated to adopt the technology in mid- to late July.) Rent one of the handhelds, and you get not only a map but also an interactive list of exhibits, guided tours to follow, even instant messaging and location tracking for other members of your group—a great feature when it's time to round up the kids.

The Smithsonian isn't alone; other museums are busily implementing a variety of forms of ubiquitous (a.k.a. pervasive) computing to assist customers. Some would argue that their efforts are not truly pervasive—the zenith of which would be environments that simply react to people without direct input or cumbersome interfaces. However, what the

museums learn about things such as delivering personalized multimedia content to mobile users, luring visitors to lesser-known exhibits and identifying how people react to interactive surroundings will help create applications for retail, entertainment and other industries.

Big SI

Smithsonian's map is but one part of the SIguide (pronounced "sigh guide") initiative, an ambitious two-year pilot project slated to launch by the end of the summer that will study handhelds' effectiveness in the museums. My Le Ducharme, SIguide's project leader, says she hopes the project will produce a better museum experience for visitors, allowing them to "spend more time here and learn more." She notes, for instance, that the average visitor spends only a few minutes in the huge gems and minerals hall. She hopes that an interactive guide might prompt visitors to spend more time in this and other underutilized exhibits.

sales tool, perhaps showing customers a video of a product in action on their PDA or cell phone.)

The handhelds will also enable museum-goers to build centrally stored scrapbooks of their visits. Leave one museum to go to another, and you'll leave the handheld behind. But you'll bring your session identity with you, which you can use in the next museum, or even on your next trip to Washington, D.C.

The handhelds also use location-tracking technology to make sure that content related to nearby exhibits is available. Interested in a particular work or artist? The map will show you where to find other displays you might like.

New Uses for Olde Tech

The technology behind these projects isn't particularly advanced. Off-the-shelf (with some minor tweaking) wireless Hewlett-Packard iPaq HX4700 handhelds connect to standard back-end servers using the

Putting the RFID in Art

Given the privacy issues surrounding radio frequency identification (RFID) tags, it might seem too controversial a technology for a museum. But the Cleveland Museum of Art is planning to deploy it this October.

The museum's upcoming exhibit—The Arts and Crafts Movement in Europe and the Americas, 1880–1920: Design for the Modern World (opening Oct. 16)—expects to feature a modern twist: RFID. The tags will collect detailed information about how visitors use the museum and will answer questions about what happens if someone comes in a group instead of alone and what exhibits interest visitors the most. The overarching goal is to determine how the museum should accommodate new technologies in a major renovation that is expected to begin in September and is due to finish in 2010.

Leonard Steinbach, Cleveland Art's CIO, says the museum doesn't expect to track anything personally identifiable. Rather, it wants to get a better sense of a patron's viewing habits so that the museum can deliver content in the most effective manner. For example, one visitor might look at the painting first, while another might look at the plate providing background information about the artist in question; it all depends on the visitor's personal preference.

By using technology that adapts to visitors, Cleveland Art curators hope to create an experience personalized for each visitor. Succeeding would earn it admiration for more than just its collection. —M.F.

"Customer resistance, capital costs and reliability have all been taken care of. The age of pervasive computing has finally arrived."

—Alex Pentland, MIT

SIguide represents a significant project in pervasive computing. With its 1,000 handhelds in place, it is "by many orders of magnitude the largest project of its type in the world," according to Ted Paschakis, CEO of Wivid Systems, which developed the Smithsonian's system.

In addition to the maps, the handhelds will link visitors to hundreds of video clips and pictures; in due time, they will also invite users to go on scavenger hunts for objects throughout the museums. Museum-goers can even use the handhelds to view interactive video clips of items that people can't actually see, such as the inside of Thomas Jefferson's desk. (Retailers and others could imagine similar technology as a

now-pedestrian 802.11b standard, and a good amount of the content is pulled from existent multimedia exhibits that the Smithsonian has developed over the years. The scrapbooking feature is simply website bookmarking in a different context.

The commonplace nature of the bulk of the technology is helping other museums get in on the activity as well. Projects are in the works at places such as New York's Museum of Modern Art, Chicago's Field Museum of Natural History, the University of British Columbia's Museum of Anthropology, the Cleveland Museum of Art and many others.

"That familiar, already-paid-for infrastructure is starting to show up in a lot of places," says Alex (Sandy) Pentland, a pro-



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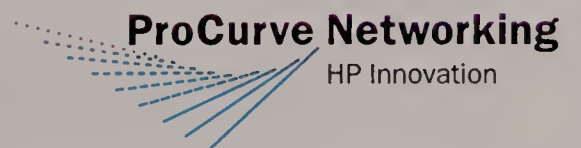
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fessor at MIT who has conducted pioneering research in fields such as wearable computing and pervasive systems. With the infrastructure mostly in place, "customer resistance, capital costs and reliability have all been taken care of. The age of pervasive computing has finally arrived," he says.

What Makes It Pervasive?

Of course, not all of the museum projects are pervasive, according to the strict definition. In fact, "a lot of what we see at this point, like the installation at the MoMA in New York, if you explained it to some of the luminaries of pervasive computing, they would scoff at it," says Alex Ledin, a senior

movie *Minority Report*, in which Orwellian television monitors use iris-scanning technology to force-feed specially targeted ads and information to Tom Cruise's on-the-run lead character. Privacy advocates can be thankful that this kind of pervasive technology remains safely in the realm of science fiction.

But experiments are already under way to study how museums' environments can influence what people do in them. The Smithsonian's interactive maps are just one example. Another comes from Cornell University's Johnson Museum. In one of the museum's galleries, sensors monitor for the presence or absence of motion. When they detect min-

The weakest point in pervasive computing is the lack of well-integrated software that is smart enough to interact with people in a wide variety of places.

consultant at SRI Consulting Business Intelligence. He says they would probably call it merely wireless data access, since the technology doesn't yet respond to users without their direct input.

Still, Ledin agrees that what museums are now doing shows that the wireless networking infrastructure needed for pervasive computing is coming together (although wireless networks continue to have dead spots, issues with interference and other as-yet-unresolved flakiness), and that the hardware is ready to go. The weakest point is the lack of well-integrated software that is smart enough to interact with people in a wide variety of places. Even so, Ledin says that the current spate of projects is significant. "They presage a time when you will be able to get information about something around you using a wireless device," he says.

They also presage some very interesting potential for how environments will interact with people. Not in the sense of the

imal activity in a certain section of the gallery, the sensors set off bird noises, which sometimes draw visitors to that section. Kirsten Boehner, a Cornell PhD candidate working on human-computer interaction issues, points to this as a way to help curators create richer museum experiences for visitors. It's easy to imagine a subliminal "blue light special" at a retailer using similar technology to draw shoppers through a store.

Pervasive Problems

Maintaining pervasive environments presents a particular challenge for museums. Technology changes rapidly, and the handheld platforms in particular present issues: Museums can't afford to build content that

The Smithsonian collection includes some **143.7M** items. More than **20M** people visited the Smithsonian museums and National Zoo in **2004**.

will run on every type of handheld. The cheapest, most widespread versions, cellular phones, aren't yet very good for displaying video or accessing the Web, because many don't have color screens or are underpowered for multimedia content delivery.

But when sufficiently powerful technology does reach ubiquity, many museums will be ready with the content.

For now, Peter S. Samis, the San Francisco Museum of Modern Art's associate curator of education and program manager of interactive educational technologies, jokes that despite installing a wireless network, the museum's technology is anything but pervasive. But Samis says he's focused on building up the museum's multimedia content (currently available primarily through its visitor education center), attending conferences such as "Museums and the Web" and watching how handheld-based projects unfold at other museums. He expects that the hardware platforms will stabilize in a couple of years, and wireless networks will be much more reliable. When that happens, he'll be ready to go with his well-developed content library.

Management and cost issues, not to mention the potential for damage and theft, aren't the only concerns museums have with handhelds. One of the biggest issues is that people tend to spend more time looking at the screen than at the exhibits. To combat

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this problem, technology designers are trying new techniques. Ubiquity Interactive, the company that built the systems in use at the UBC's Museum of Anthropology, developed what it calls "co-navigation" techniques, in which the screen prompts users to look at aspects of the art. For instance, one of its most famous pieces is the late Bill Reid's wood sculpture "Raven and the First Men." Ubiquity swathed the 7-foot-tall sculpture with infrared light, so as visitors walk around it, the picture of the sculpture onscreen turns so that they'll see the same view onscreen as in the room, with accompanying comments from a curator. "There's this back-and-forth thing between the screen and the actual artifact," says Lars Meyer, one of Ubiquity's principals.

How museums handle these issues may prove telling for commercial ventures that are looking to adopt pervasive computing. "Museums can benefit from a greater range of technology than almost any other industry," says Leonard Steinbach, CIO at the Cleveland Museum of Art. His technology needs range from digital imaging to X-ray technology to infrared, and he's working on a project that will deploy RFID (see "Putting the RFID in Art," Page 68). "Our need for this technology is as complex as a sophisticated marketer's; we're creating a communion between art and the viewer on the viewer's terms. That's a really daunting proposition."

Wivid's Paschke thinks there are huge opportunities still to come in pervasive technology. He envisions using nanogyroscopes to get much more precise location information than is currently possible. That will enable museumgoers to, say, take their handheld and pass it over a sarcophagus to view a streamed X-ray image of what's inside.

But that's tomorrow's pervasive magic.

Michael Fitzgerald is a freelance writer based outside Boston. He can be reached at michael@mffitzgerald.com.



This Game's on the Air

WIRELESS | *A Beautiful Mind*, Ron Howard's Oscar-winning film about noted economist John Nash, briefly gave popular regard to economic game theory—that is, the idea that relatively simple rules can be woven together to create models of complex economic relationships. But game theory may have additional relevance beyond economics and Academy Award nominations. Allen MacKenzie, an assistant professor in the department of electrical and computer engineering at the Virginia Polytechnic Institute and State University (a.k.a. Virginia Tech), is trying to apply game theory to another complex and seemingly amorphous pursuit: wireless networking.

"I think there's a recognition in the wireless networking community that we're missing some of the tools we need to really understand how wireless networks work," MacKenzie says. The current state of wireless network analysis, he notes, is dominated by simulation and rules of thumb. But rules of thumb are far from exact, and simulations based on sets of equations become increasingly difficult to produce as wireless implementations get more complex. (Consider, for instance, a wireless networking provider that tries to manage connections, client device power usage and interference reduction in a metropolitan area with hundreds of thousands of users, some of whom are standing still while others are rapidly moving down the highway.) MacKenzie says he believes that game-theory-based models of such environments may one day provide more precision than rules of thumb, while not requiring the complexity of detailed simulations. The ultimate goal is to create analysis tools that wireless engineers could use when designing and managing their networks.

Wireless providers have yet to come knocking on MacKenzie's door. ("We're not quite ready to answer the types of questions they'd like to ask," he says.) But the National Science Foundation was interested enough to give the professor a \$400,000 grant to continue his research.

MacKenzie can't say for certain when his theories will yield practical results, although he says that tools are at least a year or two away.

—Christopher Lindquist



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Building the Compliance Infrastructure

Service-oriented architectures have found their way to the network

BY ERIC KNORR

SOA | I've been talking about Web services' latest incarnation, service-oriented architecture (SOA), since 2001. So imagine my surprise when I heard that Cisco, EMC and a host of network appliance makers claim to be in the SOA business.

After all, SOA is confusing enough without throwing in the kitchen sink of infrastructure. Every day, people confuse SOA with one of its many applications: B2B integration, software as a service, enterprise workflow—you name it. To them I've always said, "It's applications as services, period."

But guess what? After a couple of years of singing that refrain, I've finally stopped being so narrow-minded. The reason? Many (if not most) organizations lack a sufficient motive to establish an enterprisewide SOA as I've been defining it. Yet if you broaden SOA to include an application-aware infrastructure, the SOA value proposition becomes more compelling.

The main motives for both the business side and IT to embrace SOA are quicker, cheaper application development and low-cost integration. Instead of writing a component or an application, you can call up that component or application from the app you're developing and avoid redundancy. In the process, you've probably integrated two systems with relatively little pain.

But the payback for the business side can be elusive in the short term. In fact, it actu-

ally requires more work to develop applications in a service-oriented way if an enterprisewide SOA isn't already in place. The problem is that initiatives for the greater good of the organization don't jibe with the usual application development process. Normally, the business side asks IT for particular app functionality and creates some sort of specification for just the features it needs. They don't allow for all the other applications that may share the same services, which is how an SOA needs to be designed.

So SOA needs an enterprisewide motive. And what is it that has nearly every organization in a mad scramble? Regulatory compliance. The storage and retrieval requirements of the Sarbanes-Oxley Act and the security demands of the Health Insurance Portability and Accountability Act require both ironclad enterprisewide processes and special infrastructure in the form of storage and security solutions. And without question, that infrastructure will become increasingly application-aware.

The past couple of years have seen a new breed of application-layer, XML-aware security appliances—from the likes of F5, Forum Systems and DataPower—that inspect packets at a deep level and block suspicious traffic. But these companies are going beyond XML firewalling. DataPower, for example, offers a vertical tool that binds Web services security

The problem is that initiatives for the greater good of the organization don't jibe with the usual application development process.

to XML financial schema. And Cisco's Aon initiative is supposed to result in a new line of XML-aware routers this summer. With real-time inspection of XML traffic, such devices will be able to identify compliance-related content and make sure it's routed to the correct repositories, such as EMC's Centerra for write-once archiving. Imagine an application-aware infrastructure that makes enterprise compliance transparent and relatively low maintenance. Most enterprises would give their eye teeth for that.

As a result, the real driver for SOA may come from people who see the value of an application-aware, SOA-connected infrastructure as the best long-term compliance solution. For that to work, of course, enterprise apps need to be part of an SOA. Is this the tail wagging the dog? Maybe so. But fear often turns out to be the best motivator, and if that means compliance and its related infrastructure come first, so be it.

Eric Knorr is executive editor at large for *Infoworld*. He can be reached at eknorr@pacbell.net.

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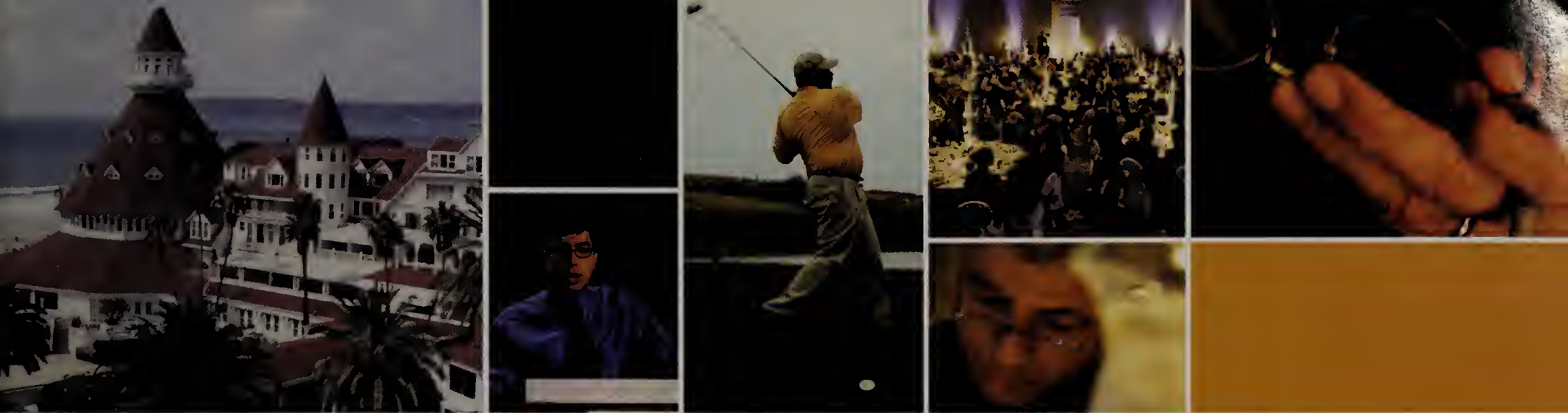


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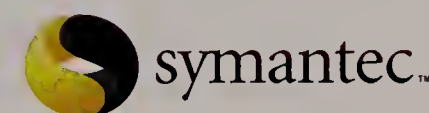
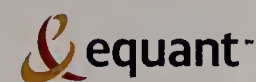
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The Termination Trap

Why are cell phone account termination fees so high?



Life is full of perplexing questions and choices. Debit or credit? That still confuses me at point-of-sale (POS) counters. How about airport arrival or departure signs? I have lost count of how many times I follow the "arrival" sign only to have to circle back to the "departure" exit. And what about that mind-numbing "paper or plastic" question asked of every shopper at the supermarket checkout? I really don't care!

Into this sea of question mania, I offer up one whose answer I do care about: Why are early termination fees from wireless telecommunications carriers up to six times the cost of the account activation fee? Logic would seem to suggest that the heavy lifting for the wireless carriers is in the up-front account activation phase where they must gather and enter customer information, billing and credit card data, and number assignment. Likewise, with the power of technology being what it is, couldn't a few simple strokes on a keyboard deactivate the account of a customer who wishes to leave?

A key culprit of onerous early termination fees is local number portability, a plan by which the Federal Communications Commission says wireless customers can move from one wireless carrier to another whenever they wish and take their numbers with them.

While I do not agree with the hefty fees the carriers impose on departing customers, I do understand the marketing logic of artificially inflating the termination fees to discourage customers from leaving their service.

But there is a better way. Cell phone usage in 21st-century America is so addictive that wireless carriers really do not need to push the demand curve with customers other than to offer plan features such as carryover minutes and anytime minutes. However, a more logical way to hold on to customers would be to do away with the huge disparity in activation and early termination fees following this formula: Add activation and early termination fees together, divide by two, and charge a customer the equal amount for account activation and early termination.

That's a solution customers would not question.

Gary J. Beach
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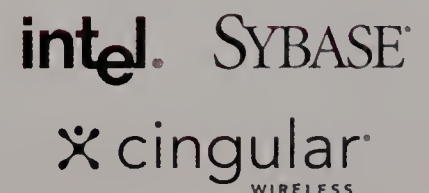
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SPECIAL REPORT:

Leadership Development

30 | ONES TO WATCH

OF ALL THE TASKS CIOs face, one of the most important—and central to their managerial role—is developing future IT leaders. Doing a good job at that helps to ensure the long-term success of the enterprise. Not to mention the near-term success of the CIO.

By Edward Prewitt

34 | HOW STARS ARE MADE

I.T. LEADERS AREN'T BORN; they're made. The honorees in our inaugural Ones to Watch special report have spent many years developing and honing their skills. Most likely, a CIO has shown them plenty of attention, guiding and sometimes pushing them. The elements of leadership development plans vary. Some CIOs rely on mentoring programs or classroom courses; others stretch their high-potential employees with cross-departmental assignments or by fast-tracking them through the IT ranks. CIOs from ING Insurance Americas, MetLife and Sun Microsystems detail what works for them. In a sense, though, the differences between the programs are inconsequential. What matters most is that CIOs have taken the time to make talent-building a top priority.

By Thomas Wailgum

40 | WHAT LEADERSHIP LOOKS LIKE

THE ONES TO WATCH honorees are a group of rising stars in IT who have been selected by *CIO* as exemplars of the next generation of CIOs. Already, they manage the majority of vendor relationships. They are responsible for the success or failure of multimillion-dollar, enterprisewide initiatives. They imagine innovative new ideas for IT-enabled change; they hire and manage your most critical employees; and they act for the CIO when he is out of the office. This story details the history behind the rise of these honorees and defines three characteristics they share: vision (and the skill to communicate it); the willingness to step up and assume responsibility; and the ability, tenacity and energy to execute.

By Stephanie Overby

50 | 33 RISING STARS

THIRTY-THREE up-and-comers; 33 short profiles in leadership.



58 | WAKE-UP CALL

FOR TOO LONG, companies have viewed their call centers as a necessary evil and a drain on their budgets. But this attitude misses the fact that a call center, when well run, can be a gold mine of customer intelligence and a true source of competitive advantage. Getting the most value out of a call center requires striking the right balance between operating efficiently and providing great service. To do that, it's necessary to empower agents with the training and information to meet customers' needs. An effective strategy should include well-defined processes (and an equally robust IT infrastructure) for capturing and sharing customer information. At Merrill Lynch, agents were instructed to focus on solving clients' problems instead of worrying about call duration, and customer satisfaction rose. As a bonus, the average length of calls actually declined.

By Alice Dragoon

67 | ESSENTIAL TECHNOLOGY: MAGICAL HISTORY TOUR MUSEUM EXHIBITS

MUSEUM EXHIBITS may often feature the old, but behind the scenes, many are using some very new technologies. Wireless PDAs, streaming video, location awareness systems and other tools are helping museums create individually customized experiences for visitors. And the efforts of these public-service organizations could provide pointers for the future of pervasive computing in commercial enterprises.

By Michael Fitzgerald

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